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# PROPOSED 10-STOREY RESIDENTIAL DEVELOPMENT
## 18 Louisa Street

Development Servicing Study and
Stormwater Management Report

# PROPOSED 10-STOREY RESIDENTIAL DEVELOPMENT
# 18 LOUISA STREET

# DEVELOPMENT SERVICING STUDY AND STORMWATER MANAGEMENT REPORT

Prepared by:

**NOVATECH**
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May 28, 2021
Revised November 10, 2021
**Revised August 7, 2024**

Ref: R-2020-130
Novatech File No. 120206

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August 7, 2024

Jennings Real Estate
Suite 402, 141 Laurier Ave W
Ottawa, ON
K1P 5J3

**Attention: Mr. Chris Packman**

Dear Sir:

**Re: Development Servicing Study and Stormwater Management Report**
**Proposed 10-Storey Residential Development**
**18 Louisa Street, Ottawa, ON**
**Novatech File No.: 120206**

Enclosed is a copy of the 'Development Servicing Study and Stormwater Management Report' for the proposed 10-storey residential development located at 18 Louisa Street, in the City of Ottawa. This report addresses the approach to site servicing and stormwater management and is submitted in support of a Site Plan Control application.

Please contact the undersigned, should you have any questions or require additional information.

Yours truly,

**NOVATECH**

François Thauvette, P. Eng.
Senior Project Manager

cc: Shawn Wessel (City of Ottawa)
Fahd Abou Zainedin (Alexander Wilson Architect Inc.)



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# 1.0 INTRODUCTION

The new 10-storey residential building is being proposed by Ironwood Fund Limited Partnership and Novatech has been retained to complete the site servicing and stormwater management design for this project. This report addresses the approach to servicing and stormwater management and is being submitted in support of a Site Plan Control (SPC) application.

## 1.1 Site Description and Location

The subject site is approximately 0.329 hectares in size and currently consists of an 'L' shaped building with surface parking lots accessible off Louisa Street and Arlington Avenue. Prior to being a Health and Sports Centre, this building was previously a school. The subject site is bordered by Louisa Street to the north, Arlington Avenue to the south, Bell Street N. to the east and a church and associated building to the west. The legal description of the subject site is designated as Lots 7, 8, 9, 10, 11, 12, 13 and 14, Registered Plan 49, City of Ottawa.

**Figure 1** – **Aerial View of the Subject Site**.


**Image Source: geoOttawa (City of Ottawa)**

## 1.2 Pre-Consultation Information

A pre-consultation meeting was held with the City of Ottawa on October 31, 2020, at which time the client was advised of the general submission requirements. Refer to **Appendix A** for a summary of the correspondence related to the proposed development.

Based on a review of **O. Reg. 525/98: Approval Exemptions**, a Ministry of the Environment, Conservation and Parks (MECP) Environmental Compliance Approval (ECA) is anticipated to

be required because the storm flows from this site are being directed into a combined sewer in Louisa Street. A pre-consultation meeting has not been held with the MECP.

The subject site is located within the jurisdiction of the Rideau Valley Conservation Authority (RVCA). Based on discussions with the RVCA, stormwater quality control will not be required for this development as the storm sewer flows are being directed into the combined sewer system in Louisa Street.

## 1.3 Proposed Development

The proposed development will consist of a new 10-storey residential building adjoining a portion of the existing building (that is to be maintained). The proposed 10-storey residential building will be serviced by extending new laterals to the municipal combined sewer and watermains adjacent to the site. Barrier-free access to the proposed building will be provided off Bell Street N. and Louisa Street. Access to the underground parking levels and to the loading space will be provided off Arlington Avenue, on the south side of the building. The western portion of the existing building will be incorporated into the overall design of the site, however, the portion of the site to be maintained will continue to be serviced by the existing building laterals to Louisa Street.

## 1.4 Reference Material

The following reports and studies were reviewed as part of the design process:

[1] The Geotechnical Investigation Report (Ref. No. PG5405-1, Rev. 3), prepared by Paterson Group on July 24, 2024.

# 2.0 SITE SERVICING

The objective of the site servicing design is to provide proper sewage outlets, a suitable domestic water supply and to ensure that appropriate fire protection is provided for the proposed development. As discussed with the City of Ottawa, the total allowable flow from the subject site being directed to the combined sewer in Louisa Street is to include:

- Peak sanitary sewage flows
- Ground water flows (Less than 25,000 L/day per section 6.5 of the Geotech Report[1])
- Peak stormwater flows

The total flow from the site (summarized in **Section 2.3.4** of the Report) is being provided to the City of Ottawa for their review in confirming that the municipal combined sewer system has adequate capacity to accommodate the proposed development.

The servicing criteria, the expected sewage flows, and the water demands are to conform to the City of Ottawa municipal design guidelines for sewer and water distribution systems. Refer to the subsequent sections of the report for further details.

The City of Ottawa Servicing Study Guidelines for Development Applications requires that a Development Servicing Study Checklist be included to confirm that each applicable item is deemed complete and ready for review by City of Ottawa Infrastructure Approvals. A completed checklist is enclosed in **Appendix B** of the report.

## 2.1 Sanitary Sewage

The proposed residential development will be serviced by a new 200mm dia. sanitary sewer connected to the existing 300mm dia. combined sewer in Louisa Street.

The City of Ottawa design criteria were used to calculate the theoretical sanitary flows for the proposed development. The following design criteria were taken from Section 4 – 'Sanitary Sewer Systems' and Appendix 4-A - 'Daily Sewage Flow for Various Types of Establishments' of the City of Ottawa Sewer Design Guidelines:

Residential Use

- Residential Units (Studio or 1-Bedroom): 1.4 people per unit
- Residential Units (2-Bedroom): 2.1 people per unit
- Residential Units (3-Bedroom): 3.1 people per unit
- Average Daily Residential Sewage Flow: 280 L/person/day (ISTB-2018-01)
- Residential Peaking Factor = 3.73 (Harmon Equation)
- Infiltration Allowance: 0.33 L/s/ha (ISTB-2018-01)

**Table 1** identifies the theoretical sanitary flows for the proposed residential development based on the above design criteria.

**Table 1: Theoretical Post-Development Sanitary Flows**

| Residential Use | Unit Count | Design Population | Average Flow (L/s)* | Peaking Factor | Total Peak Flow (L/s)** |
|---|---|---|---|---|---|
| Studio / 1-Bedroom | 119 | 167 | 0.54 | 3.7 | 2.01 |
| 2-Bedroom | 40 | 84 | 0.27 | 3.7 | 1.01 |
| 3-Bedroom | 1 | 3 | 0.01 | 3.7 | 0.04 |
| Infiltration Allowance | - | - | - | - | 0.06 |
| **Total** | **160** | **254** | **0.82** | **-** | **3.12** |

*Represents rounded values
**Existing building not included in calculations (to continue to be serviced by the existing sanitary and water laterals)

As indicated in the table above, the peak sanitary flow to the combined sewer in Louisa Street was calculated to be approximately 3.12 L/s. Refer to **Appendix C** for a copy of the theoretical sanitary flow calculations.

A 200mm dia. sanitary gravity sewer at a minimum slope of 1.0% has a full flow conveyance capacity of 34.2 L/s and will have enough capacity to convey the theoretical sanitary flows for the proposed development.

## 2.2 Water Supply for Domestic Use and Firefighting

The subject site is located within the City of Ottawa 1W pressure zone. The proposed residential development will be serviced by twin 150mm dia. water services connected to the existing 203mm dia. PVC watermains in Louisa Street and Bell Street N. The anticipated daily water

demands will be greater than 50m$^3$/day (~0.58 L/s), therefore, the proposed development will require two (2) water supplies for redundancy purposes. The proposed building will be sprinklered and the water meter will be located within the water entry room, with the remote meter and siamese connection on the exterior face of the building.

### *2.2.1 Water Demands and Watermain Analysis*

The theoretical water demand and fire flow calculations are based on criteria in the City of Ottawa Design Guidelines – Water Distribution. The fire flow requirements were calculated per the Fire Underwriters Survey (FUS) as indicated in City of Ottawa Technical Bulletin ISTB-2021-03, based on information provided by the architect. The following design criteria were taken from City of Ottawa Sewer Design Guidelines and subsequent Technical Bulletins:

- Residential Units (Studio or 1 Bedroom): 1.4 people per unit
- Residential Units (2 Bedroom): 2.1 people per unit
- Residential Units (3 Bedroom): 3.1 people per unit
- Average Daily Residential Water Demand: 280 L/person/day (ISTB-2021-03)
- Maximum Day Demand Peaking Factor = 2.5 x Avg. Day Demand (City Water Table 4.2)
- Peak Hour Demand Peaking Factor = 2.2 x Max. Day Demand (City Water Table 4.2)

**Table 2** identifies the theoretical domestic water demands for the proposed residential development based on the above design criteria.

**Table 2: Theoretical Water Demand for the Proposed Development**

| Residential Use | Unit Count | Design Population | Average Day Demand (L/s)* | Max. Day Demand (L/s)* | Peak Hour Demand (L/s)* |
|---|---|---|---|---|---|
| Studio / 1-Bedroom | 119 | 167 | 0.54 | 1.35 | 2.97 |
| 2-Bedroom | 40 | 84 | 0.27 | 0.68 | 1.50 |
| 3-Bedroom | 1 | 3 | 0.01 | 0.03 | 0.06 |
| **Total** | **160** | **254** | 0.82 | **2.06** | **4.53** |

*Existing building not included in calculations (to continue to be serviced by the existing sanitary and water laterals).

The following design criteria were taken from Section 4.2.2 – 'Watermain Pressure and Demand Objectives' of the City of Ottawa Design Guidelines for Water Distribution:

- Normal operating pressures are to range between 345 kPa (50 psi) and 483 kPa (70 psi) under Max Day demands
- Minimum system pressures are to be 276 kPa (40 psi) under Peak Hour demands
- Minimum system pressures are to be 140 kPa (20 psi) under Max Day + Fire Flow demands

Preliminary domestic water demands, and fire flow requirements were provided to the City of Ottawa. These values were used to generate the municipal watermain network boundary conditions. **Table 2.1** below summarizes the watermain boundary conditions and the results of the hydraulic analysis related to the domestic demands. It is anticipated that a booster pump will be required to increase pressure to the upper floors of the building.

**Table 2.1: Hydraulic Boundary Condition Provided by the City**

| Municipal Watermain Boundary Condition | Boundary Condition Head of Water (m) | Normal Operating Pressure Range (psi) | Anticipated WM Pressure (psi)* |
|---|---|---|---|
| **1 x 150mm dia. Service at Connection #1 (203mm dia. WM in Louisa Street)** | | | |
| Minimum HGL (Peak Hour Demand) | 107.1 m | 40 psi (min.) | ~ 50 psi |
| Maximum HGL (Max Day Demand) | 115.3 m | 50-70 psi | ~ 62 psi |
| HGL Max Day + Fire Flow | 105.6 m | 20 psi (min.) | ~ 48 psi |
| **1 x 150mm dia. Service at Connection #2 (203mm dia. WM in Bell Street N.)** | | | |
| Minimum HGL (Peak Hour Demand) | 107.1 m | 40 psi (min.) | ~ 50 psi |
| Maximum HGL (Max Day Demand) | 115.3 m | 50-70 psi | ~ 62 psi |
| HGL Max Day + Fire Flow | 105.9 m | 20 psi (min.) | ~ 48 psi |

*Based on an approximate street elevation of 71.6m at WM connections. Design pressure = (HGL – watermain elevation) x 1.42197 PSI/m.

Based on preliminary calculations and correspondence received from the City of Ottawa, it is anticipated that the pressure within the municipal watermain network will be adequate. Given the height of the proposed building, booster pumps may be required to provide adequate water pressure to the upper floors.

As discussed with the City of Ottawa, a multi-hydrant approach to firefighting will be required to supply adequate fire flow to the proposed development. There are currently four (4) Class AA (blue bonnet) municipal fire hydrants within 75m of the subject site and at least three (3) additional hydrants within 150m of the site. Based on the City of Ottawa Technical Bulletin ISTB-2018-02, Class AA (blue bonnet) hydrants within 75m of the building should provide a maximum capacity 95 L/s each (at a pressure of 20 PSI) while hydrants between 75m and 150m should provide at least 63 L/s (at a pressure of 20 PSI). **Table 2.2** summarizes the theoretical combined fire flow available from the nearby municipal fire hydrants and compares it to the fire flow demands based on the FUS calculations.

**Table 2.2**: **Theoretical Fire Protection Summary Table**

| Building | (FUS) Fire Flow Demand (L/s) | Fire Hydrant(s) within 75m (~ 95 L/s each) | Fire Hydrant(s) within 150m (~ 63 L/s each) | Theoretical Combined Available Fire Flow (L/s) |
|---|---|---|---|---|
| 10-Storey Building | 183 | 4 | 3 | **>183** |

The combined maximum flow from the nearby municipal hydrants will exceed the Max Day + Fire Flow requirement of the proposed development. This multi-hydrant approach to firefighting is in accordance with the City of Ottawa Technical Bulletin ISTB-2018-02. Refer to **Appendix D** for detailed calculations, correspondence from the City of Ottawa, fire hydrant sketch showing the existing fire hydrant locations and the dimensions confirming the appropriate site coverage.

## 2.3 Storm Drainage and Stormwater Management

As discussed with the City of Ottawa, the western portion of the existing site (0.138 ha), which is to be maintained, will be excluded from the SWM calculations, as there is limited opportunity to control the runoff from this portion of the site. On-site stormwater management will however be required for the remaining portion of the site to be developed (0.191 ha). Stormwater runoff from the western portion of the site will continue to sheet drain uncontrolled towards Louisa and Arlington Streets.

The proposed storm outlet for the site to be developed is the existing 300mm dia. PVC combined sewer in Louisa Street, which in turn flows into a combined sewer in Bell Street N. Since the post-development storm flows are ultimately being directed to a combined sewer, they will need to be controlled prior to being released from the site. The total site allowable flow will be a combination of the peak sanitary flows, anticipated groundwater flows and the allocated stormwater flow components, as specified by the City of Ottawa.

The proposed storm drainage and stormwater management design for the site is discussed in the following sections of the report.

### *2.3.1 Stormwater Management Criteria and Objectives*

The stormwater management criteria and objectives for the site are as follows:

- Control the post-development flows from the site to the allocated release rate (i.e. allowable 2-year release rate specified by the City of Ottawa minus the peak sanitary and ground water flow components). Control post-development flows from the portion of the site being developed (i.e. new building), excluding the western portion of the site to remain, for storms up to and including the 100-year design event.
- Minimize the impact on the existing combined sewer system in Louisa and Bell Streets by reducing the post-development storm flows from the site, when compared to current conditions.
- Provide guidelines to ensure that site preparation and construction is in accordance with the current Best Management Practices for Erosion and Sediment Control.

### *2.3.2 Pre-Development Conditions and Allowable Release Rate*

The uncontrolled pre-development flows from the 0.191 ha portion of the site to be developed were calculated using the Rational Method to be 46.9 L/s during the 5-year design event and 89.6 L/s during the 100-year design event. Refer to **Appendix E** for detailed calculations. There are currently no known water quantity or water quality control measures being provided on site.

As specified by the City of Ottawa, the allowable release rate from the site (including the sanitary and groundwater flow components) was calculated using the Rational Method, based

on a 10-minute rainfall intensity, using a 2-year return period (City of Ottawa IDF Curves), and a runoff coefficient of 0.50.

$T_c$ = 10 min C =0.50
$I_{2yr}$ = 76.81 mm/hr A = 0.191 ha

$Q_{allow}$ = 2.78 CIA
= 2.78 x 0.50 x 76.81 x 0.191
= 20.4 L/s

As stated above, the total site allowable flow to the combined sewer system in Louisa Street will be a combination of the peak sanitary flow, anticipated groundwater flow and the allocated stormwater flow components.

- The peak sanitary flow from **Table 1** above was calculated to be 3.12 L/s.
- The anticipated groundwater corresponds to a maximum flow rate of approximately 0.29 L/s (based on the geotechnical estimate of less than 25,000 L/day/building).
- The remaining site flow allocated for stormwater management is therefore 16.99 L/s. (20.4 L/s – (3.12 L/s peak sanitary flow + 0.29 L/s groundwater flow).

### *2.3.3 Post-Development Conditions*

The proposed site will be serviced by connecting to the existing 300mm dia. combined sewer in Louisa Street. Stormwater runoff from the new building roof, lower roof terraces and ground level amenity area will be directing to an internal stormwater storage tank and controlled prior to being discharged into the municipal sewer in Louisa Street. Runoff from the site entrances to the underground parking and a portion of the side yards along Louisa, Arlington and Bell Streets will sheet drain uncontrolled towards existing catchbasins within the municipal right-of-way.

Due to the requirement to maintain and protect the existing building on the western portion of the property, runoff from the side yards and parking area for that building will continue to sheet drain uncontrolled towards Louisa and Arlington Streets. Runoff from this existing catchment area to remain is not included in the overall SWM calculations. Refer to plan 120206-SWM for the relevant drainage areas, area I.D.'s and runoff coefficients.

#### 2.3.3.1 Areas A-1: Uncontrolled Direct Runoff

The runoff from this sub-catchment area will flow overland towards the roadway catch basins in Louisa, Arlington, and Bell Streets. The uncontrolled post-development flows from sub-catchment area A-1 were calculated using the Rational Method to be approximately 6.5 L/s during the 5-year design event and 12.4 L/s during the 100-year design event. Refer to **Appendix D** for detailed calculations.

#### 2.3.3.2 Area A-2: Controlled Building Flows

Stormwater runoff from this sub-catchment area will be captured by the courtyard deck drains as well as the building roof / terrace drains and directed to an internal stormwater storage tank. Stormwater collected within the storage tank will be pumped up to the proposed storm service and released into the existing combined sewer in Louisa Street. A pump (designed by the mechanical consultant) is required to control flow from the tank to a maximum rate of 4.5 L/s (71.3 USGPM), which corresponds to the maximum flow allocated for this catchment area. A "stand-by" pump will be provided for emergency and/or maintenance purposes. An emergency

back-up power supply will also be provided. The pump will act as the backflow prevention device to protect the building from any potential sewer back-ups.

**Table 3** summarizes the post-development stormwater design flows and storage volumes for the 2-year, the 5-year and the 100-year design events.

**Table 3: Internal Stormwater Storage Tank and Pumped Flow**

| Design Event | Post-Development Conditions | | |
|---|---|---|---|
| | Pumped Design Flow (L/s) | Volume Required ($m^3$) | Volume Provided ($m^3$) |
| 2-Year | 4.5 L/s | 18.9 $m^3$ | > 69 $m^3$ |
| 5-Year | | 28.9 $m^3$ | |
| 100-Year | | 68.3 $m^3$ | |

As indicated in the table above, the internal stormwater storage tank will provide adequate storage for both the 5-year and 100-year design events. Refer to **Appendix E** for detailed calculations. CBMH 1 will act both as an access point into the internal SWM tank as well as an emergency overflow allowing storms in excess of the 100-year design event to overflow to the surface and spill towards Louisa Street.

#### 2.3.3.3 Stormwater Flow Summary

**Table 3.1** provides a summary of the total post-development flows from the site to be developed and compares them to the uncontrolled pre-development flows and flows allocated to the stormwater component of the total flow to the combined sewer.

**Table 3.1: Stormwater Flows Comparison Table**

| Design Event | Pre-Development Conditions | | Post-Development Conditions | | | |
|---|---|---|---|---|---|---|
| | Uncontrolled Flow (L/s) | Allocated Release Rate (L/s) | A-1 Flow (L/s) | A-2 Flow (L/s) | Total Flow (L/s) | Reduction in Flow (L/s or %) * |
| 5-Yr | 46.9 | 16.99 | 6.5 | 4.5 | 11.0 | 35.9 or 77% |
| 100-Yr | 89.6 | | 12.4 | | 16.9 | 72.7 or 81% |

*Reduced flow compared to pre-development uncontrolled conditions.

A 250mm dia. storm service at a minimum slope of 1.0% has a full flow conveyance capacity of 62.0 L/s and will have enough capacity to convey the theoretical storm flows for the proposed development.

### *2.3.4 Summary of Total Flow to Municipal Combined Sewer*

As stated above, the total site allowable flow to the combined sewer system in Louisa Street will be a combination of the peak sanitary flow, anticipated groundwater flow and the allocated stormwater flow components.

**Table 3.2** provides a summary of the total post-development flows from the site to be developed and compares them to the uncontrolled pre-development flows and allowable release rate specified by the City of Ottawa.

**Table 3.2: Site Flows Summary and Comparison Table**

| Design Event | Pre-Development Conditions | | Post-Development Conditions | | | | |
|---|---|---|---|---|---|---|---|
| | Uncontrolled Storm Flow (L/s) | Allowable Release Rate (L/s) | Sanitary Flow (L/s) | Ground Water Flow (L/s) | Storm Flow (L/s) | Total Flow (L/s) | Reduction in Flow (L/s or %)* |
| 5-Yr | 46.9 | 20.4 | 3.12 | 0.29 | 11.0 | 14.4 | 32.5 or 69% |
| 100-Yr | 89.6 | | | | 16.9 | 20.3 | 69.3 or 77% |

*Reduced flow compared to uncontrolled pre-development stormwater runoff conditions (excl. pre-development sanitary and ground water flow components).

The total flow from the site to be developed is being provided to the City of Ottawa for their review in confirming that the municipal combined sewer system has adequate capacity to accommodate the proposed development.

### *2.3.5 Stormwater Quality Control*

The subject site is located within the jurisdiction of the Rideau Valley Conservation Authority (RVCA). Based on discussions with the City of Ottawa and the RVCA, stormwater quality control will not be required for this development as the subject site is located within a combined sewershed. Refer to **Appendix A** for a copy of the correspondence received from the RVCA.

## 3.0 SITE GRADING

The existing site is relatively flat, with elevations varying from approximately 72.3m at both the northwest and southeast property corners down to approximately 71.8m at the southwest property corner and approximately 71.74m near the intersection of Louisa Street and Bell Street N. The western portion of the existing site generally slopes both north and south directions from the highpoint on-site towards the existing right-of ways. The eastern portion of the existing site is generally flat, and the grade drops off to the north along the existing parking lot entrance off Louisa Street. The finished floor elevation (FFE) of the proposed residential building will be set at an elevation of 72.50m to tie into the existing building elevations and provide barrier-free access at the main residential entrance. The FFE of the existing building to remain will be maintained and currently varies between 72.23m and 72.62m. The grades around the existing building to remain will also generally be maintained. Refer to the enclosed Grading and Erosion & Sediment Control Plan (120206-GR) for details.

## 4.0 GEOTECHNICAL INVESTIGATIONS

A Geotechnical Investigation Report (Ref. No. PG5405-1, Rev. 3, Dated July 24, 2024) has been prepared by Paterson Group for the proposed project. Refer to the Geotechnical Report[1] for subsurface conditions, construction recommendations and geotechnical inspection requirements.

## 5.0 EROSION AND SEDIMENT CONTROL

To mitigate erosion and to prevent sediment from entering the municipal sewer system, temporary erosion and sediment control measures will be implemented on-site during construction in accordance with the Best Management Practices for Erosion and Sediment Control. This includes the following temporary measures:

- Filter bags and/or Filter socks will be placed under the grates or at the curb inlet openings of nearby catchbasin structures and will remain in place until vegetation has been established and construction is completed.
- Silt fencing will be placed per OPSS 577 and OPSD 219.110 along the surrounding construction limits.
- Mud mats will be installed at the site construction entrances.
- Street sweeping and cleaning will be performed, as required, to suppress dust and to provide safe and clean roadways adjacent to the construction site.
- On-site dewatering is to be directed to a sediment trap and/or gravel splash pad and discharged safely to an approved outlet as directed by the engineer.

The temporary erosion and sediment control measures will be implemented prior to construction and will remain in place during all phases of construction. Regular inspection and maintenance of the erosion control measures will be undertaken.

## 6.0 CONCLUSION

This report has been prepared in support of a Site Plan Control application for the proposed residential development located at 18 Louisa Street.

The conclusions are as follows:

- The proposed 10-storey residential building will be serviced by extending new laterals to the municipal combined sewer in Louisa Street. Redundant water services will be extended from the existing municipal watermains in Louisa and Bell Streets.
- The building will be sprinklered and supplied with a fire department siamese connection. The siamese connection will be located within 45m of the municipal fire hydrant at the south-west corner of the intersection of Arlington Street and Bell Street N.
- The site flows from sub-catchment area A-1 will be uncontrolled to the adjacent municipal right-of-ways. The flows from sub-catchment area A-2 will be directed to an internal SWM tank and controlled prior to being discharged into the municipal combined sewer system in Louisa Street.
- The total post-development flow for the portion of the site being developed will be approximately 14.4 L/s during the 5-year design event and 20.3 L/s during the 100-year event. The combined flows are less than the allowable combined release rate of 20.4 L/s. Furthermore, post-development flows will be significantly reduced when compared to current conditions.

- Regular inspection and maintenance of the building services, roof and deck drains, internal SWM storage system, pumps and back-up power supply is recommended to ensure that the storm drainage system is clean and operational.
- Temporary erosion and sediment control measures are to be provided during construction.

It is recommended that the proposed site servicing and stormwater management design be approved for implementation.

**NOVATECH**

Prepared by:


François Thauvette, P. Eng.
Senior Project Manager

# APPENDIX A

## Correspondence

**Formal Pre-Application Consultation Meeting Minutes**
**PC2019-0274**
**18 Louisa Avenue**
**Thursday, October 31, 9:00 a.m. – 10:00 a.m.**

**Attendees**

*City of Ottawa*
John Bernier, File Lead
Christopher Moise, Urban Design
Shawn Wessel, Engineer
Wally Dubyk, Transportation
Urja Modi, Student Planner

*Applicant Team*
Scott Alain
Carl Furney
Ed McKenna
Daniel Donelly
Kenneth Jennings
Christian Jennings

*Community Representative*
Eric Darwin*, Dalhousie Community Association

*Eric Darwin signed a Non-Disclosure Agreement (NDA) prior to this meeting.

Note: Shawn Wessel from City of Ottawa was unable to attend this meeting but will be included in the pre-application consultation correspondence.

**Proposal Overview**

The applicant team is seeking to rezone the subject site from Minor Institutional to Residential Fifth Density to permit the construction of a mid-rise residential development that tapers in height from 9 storeys to 6 storeys, and contains 100+ units, below-grade residential parking, and visitor surface parking. The proposed development will include landscaped and rooftop amenity spaces.

**Comments from related discipline**

Planning

*City staff: John Bernier*

The subject site is located within the General Urban Area of the Official Plan. This section permits the proposed use and supports greater height. The applicant team is advised to focus on justifying compatibility with the character of the neighbourhood, specifically between the north and south frontages where lower densities exist. City staff share the following comments regarding the proposed development:

- The first design of the proposed development makes good use of the corner and provide good transition from the LIV building to surrounding low-rise dwellings. Greater attention to design will be required to address the corridor created by facing a tall building in front of another tall building.
- The applicant team is advised to show greater detail for proposed parking and amenity spaces.
- Greater clarification of the uses of the landscaped amenity space is required (i.e. public, public/private, or private).
- City trees (assets) have been identified along the perimeter of the subject site; the City will want to retain these trees. Zoning can be fitted to allow for the retention of these trees; if retention is not possible, then the applicant team will be required to pay compensation.

The following plans will be required:

- Wind study
- Sun/shadow analysis
- Tree Conservation Report

The City Forester will follow up with specific requirements regarding the trees and landscaping of the subject site. The proposed development will be subject to applications for a Major Zoning By-Law Amendment and a Complex Site Plan Control.

Engineering
*City staff: Shawn Wessel*

City staff was unable to attend this meeting. Engineering notes and a list of required plans and studies will be provided in the pre-application consultation correspondence.

Transportation
*City staff: Wally Dubyk*
The applicant team will be required to submit Steps 1 and 2 of a Transportation Impact Assessment when filing for any future application.

City staff will review and provide comments for site triangles.

Urban Design
*City staff: Christopher Moise*
The applicant team is advised to conduct a thorough design analysis that addresses the canyon effect, sun/shadow effect, and the corridor created by steep walls. City staff advise that a 6-storey to 12-storey transition may be more appropriate and will have less impact on the canyon effect. It is recommended that modelling be used for justification purposes, to explore other design options, and to illustrate the city.

Comments from community representatives
*Eric Darwin, Dalhousie Community Association*
The community representative (CR) shares the City's concerns regarding the 9-storey potion of the building facing the LIV units. The community representative suggests to the applicant team to re-mass or reorient the entirety of the project by 90 degrees clockwise so that the 9-storey wall would be fronting onto Arlington Avenue. The community representative expresses the following additional concerns and recommendations about the proposed development:

- It is a dubious repute to add a laneway to the site considering there are multiple laneways within the area.
- The CR supports the idea of incorporating at-grade townhouses but expresses that the townhouse portion of the project is not big enough and it should be extended over the lot line. Additionally, the CR suggests fronting townhouses onto Bell Street.

**Next Steps**
The applicant team is advised to keep the File Lead and Design Lead updated. It is also recommended that the applicant team seek input from the Ward Councillor, Community Association, and neighbouring property owners.

## Steve Matthews

**From:** Wessel, Shawn <shawn.wessel@ottawa.ca>
**Sent:** Thursday, January 7, 2021 2:06 PM
**To:** Francois Thauvette; Bernier, John
**Cc:** Steve Matthews
**Subject:** RE: 18 Louisa Ave - Pre-Consultation Meeting Minutes
**Attachments:** 18 Louisa Pre-Consul Notes for the File Lead.pdf

Here you are Francois.

Happy New Year!

If you require additional information or clarification, please do not hesitate to contact me anytime.

Thank you

***Regards,***


**Shawn Wessel, A.Sc.T.,rcji**
**Project Manager - Infrastructure Approvals**
**Gestionnaire de projet – Approbation des demandes d'infrastructures**

**Development Review Central Branch | Direction de l'examen des projets d'aménagement, Centrale**
**Planning, Infrastructure and Economic Development Department | Direction générale de la planification de l'infrastructure et du développement économique**
**City of Ottawa | Ville d'Ottawa**
**110 Laurier Ave. W. | 110, avenue Laurier Ouest, Ottawa ON K1P 1J1**
**(613) 580 2424 Ext. | Poste 33017**
**Int. Mail Code | Code de Courrier Interne 01-14**
**shawn.wessel@ottawa.ca**




*****Please also note that, while my work hours may be affected by the current situation and am working from home, I still have access to email, video conferencing and telephone. Feel free to schedule video conferences and/or telephone calls, as necessary.*****

**From:** Francois Thauvette <f.thauvette@novatech-eng.com>
**Sent:** January 07, 2021 10:18 AM
**To:** Wessel, Shawn <shawn.wessel@ottawa.ca>; Bernier, John <John.Bernier@ottawa.ca>
**Cc:** Steve Matthews <S.Matthews@novatech-eng.com>
**Subject:** 18 Louisa Ave - Pre-Consultation Meeting Minutes



Hi Shawn and John,

Would it be possible for you provide the engineering design criteria along with the list of required plans and studies for this site? They were never provided as part of the (attached) pre-consultation meeting minutes we received from the architect.

Regards,

**François Thauvette**, P. Eng., Senior Project Manager | Land Development & Public Sector Engineering
**NOVATECH** Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 219 | Cell: 613.276.0310 | Fax: 613.254.5867

**Pre-Consul Meeting Notes to the File Lead – John Bernier** **October 28, 2019**
**Re: 18 Louisa Street**

**Infrastructure:**

Louisa St.:
A 152 mm dia. DI Watermain (c. 2003) is available

A 300 mm dia. Conc. Combined Sewer (c. 2003) is available, which drains to Preston Street Trunk, Booth Street Trunk and then to Interceptor Sewer.

Bell St.:

A 203 mm dia. DI Watermain (c. 2003) is available

A 300 mm dia. Conc. Combined Sewer (c. 2002) is available, which drains to Preston Street Trunk, Booth Street Trunk and then to Interceptor Sewer.

Arlington Ave.:

A 203 mm dia. DI Watermain (c. 2003) is available

A 300 mm dia. Conc. Combined Sewer (c. 2002) is available, which drains to Preston Street Trunk, Booth Street Trunk and then to Interceptor Sewer.

The following apply to this site and any development within a combined sewer area:

- **Total** (San & Stm) allowable release rate will be 2 year pre-development rate.
- Coefficient (C) of runoff will need to be determined **as per existing conditions** but in no case more than 0.4
- TC = 20 minutes or can be calculated
  TC should be not be less than 10 minutes, since IDF curves become unrealistic at less than 10 min.
- Any storm events greater than 2 year, up to 100 year, and including 100 year storm event must be detained on site.
- Two separate sewer laterals (one for sanitary and other for storm) will be required.

An MECP ECA will be required.

Please have applicant provide one copy of the following for our review:

- MECP ECA Application Form - Direct Submission tied to SPC
- Fees - Certified Cheque made out to "Ministry of Finance"
- Proof of Applicant's Identification (if no Certificate of Incorporation)
- Certificate of Incorporation (if Applicable)
- NAICS Code (If Applicable)
- Plan & Profile
- Grading and Servicing Plans
- Survey Plan
- Pipe Data Form
- Draft ECA (City of Ottawa Expanded Works Form)
- Source Protection Policy Screening & Significant Threat Report
- Sewer Drainage Area Plan
- SWM Report
- Services Report
- Geotechnical Report & any other supportive documentation
- Correspondence: City of Ottawa including ROW, Water Resources Dept., ISD etc., MNR, Conservation Authority & MECP.

Please note that once the review has been completed and the Sr. Engineer is satisfied and ready to sign off on the application, after the PM recommendations 3 final bound copies including 3 CD Rom disks will be required to accompany the applications with MECP and for City of Ottawa records.

Footer of ECA Application should have reference #: 8551E (2019/05)

Please also note:
Foundation drains are to be independently connected to sewermain (separated or combined) unless being pumped with appropriate back up power, sufficient sized pump and back flow prevention.

Roof drains are to be connected downstream of any incorporated ICD within the SWM system.

**Other:**

If residential component to proposal the following applies:
Due to more sensitive use, an Record of Site Condition (RSC) is required. Ensure Phase I, and if applicable, Phase II ESA's speak to required RSC.

Environmental Noise Study is required due to within proximity of 500 m of Hwy #417.

Stationary Noise Study – consultant to speak to this in their report as per City NCG and NPC 300 Guidelines.

If high rise is proposed, Shadow Study will be required for this proposal.

If 9 storeys or greater, a Wind Study will be required for this proposal.

Capital Works Etc.:
Catherine St. Resurfacing and infrastructure planned for 3-5 years.
MTO bridge replacement for 417 planned for 3-10 years

Water Supply Redundancy – Fire Flow:

Applicant to ensure that a second service with an inline valve chamber be provided where the average daily demand exceeds 50 $m^3$ / day (0.5787 l/s per day)
FUS Fire Flow Criteria to be used unless a low-rise building, where OBC requirements may be applicable.

Where underground storage (UG) and surface ponding are being considered:

Show all ponding for 5 and 100 year events

Above and below ground storage is permitted although uses ½ Peak Flow Rate or is modeled. Please confirm that this has been accounted for and/or revise.

Rationale:

The Modified Rational Method for storage computation in the Sewer Design Guidelines was originally intended to be used for above ground storage (i.e. parking lot) where the change in head over the orifice varied from 1.5 m to 1.2 m (assuming a 1.2 m deep CB and a max ponding depth of 0.3 m). This change in head was small and hence the release rate fluctuated little, therefore there was no need to use an average release rate.

When underground storage is used, the release rate fluctuates from a maximum peak flow based on maximum head down to a release rate of zero. This difference is large and has a significant impact on storage requirements. We therefore require that an average release rate be used to estimate the required volume. Alternatively, the consultant may choose to use a submersible pump in the design to ensure a constant release rate.

In the event that there is a disagreement from the designer regarding the required storage, The City will require that the designer demonstrate their rationale utilizing dynamic modelling, that will then be reviewed by City modellers in the Water Resources Group.

Note that the above will added to upcoming revised Sewer Design Guidelines to account for underground storage, which is now widely used.

Further to above, what will be the actual underground storage provided during the major (100 year) and minor (2 year) storm events?

Please provide information on UG storage pipe. Provide required cover over pipe and details, chart of storage values, capacity etc. How will this pipe be cleaned of sediment and debris?

Note - There must be at least 15cm of vertical clearance between the spill elevation and the ground elevation at the building envelope that is in proximity of the flow route or ponding area. The exception in this case would be at reverse sloped loading dock locations. At these locations, a minimum of 15cm of vertical clearance must be provided below loading dock openings. Ensure to provide discussion in report and ensure grading plan matches if applicable.

Provide information on type of underground storage system including product name and model, number of chambers, chamber configuration, confirm invert of chamber system, top of chamber system, required cover over system and details, interior bottom slope (for self-cleansing), chart of storage values, length, width and height, capacity, entry ports (maintenance) etc.

Provide a cross section of underground chamber system showing invert and obvert/top, major and minor HWLs, top of ground, system volume provided during major and minor events. UG storage to provide actual 2 and 100 year event storage requirements.

In regard to all proposed UG storage, ground water levels (and in particular HGW levels) will need to be reviewed to ensure that the proposed system does not become surcharged and thereby ineffective.

Modeling can be provided to ensure capacity for both storm and sanitary sewers for the proposed development by City's Water Distribution Dept. – Modeling Group, through PM and upon request.

For proposed depressed driveways or developments with private lanes, parking areas or with entrances etc. lower than roadway…

S18.pdf S18.1.pdf

Provided Info:
Please be advised that it is the responsibility of the applicant and their representatives/consultants to verify information provided by the City of Ottawa.
Please contact City View and Release Info Centre at Ext. 44455

**Environmental Source Information:**

City of Ottawa - Historical Land Use Inventory (HLUI) - Required

Rationale:

The HLUI database is currently undergoing an update. The updated HLUI will include additional sources beyond those included in the current database, making the inclusion of this record search even more important.
Although a municipal historic land use database is not specifically listed as required environmental record in O. Reg 153/04, Schedule D, Part II states the following:

The following are the specific objectives of a records review:

1. To obtain and review records that relate to the Phase I (One) property and to the current and past uses of and activities at or affecting the Phase I (One) property in order to determine if an area of potential environmental concern exists and to interpret any area of potential environmental concern.

2. To obtain and review records that relate to properties in the Phase I (One) study area other than the Phase I (One) property, in order to determine if an area of potential environmental concern exists and to interpret any area of potential environmental concern.

It is therefore reasonable to request that the HLUI search be included in the Phase I ESA to meet the above objectives.
Please submit.

**FYI :**

All existing reports and plans will need to be revised if older than 2 years and must reflect current City Standards, Guidelines, By-laws and Policies.

Please refer to City of Ottawa website portal **for "Guide to preparing Studies and Plans"** at https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans.

Please ensure you are using the current guidelines, bylaws and standards including materials of construction, disinfection and all relevant reference to OPSS/D and AWWA guidelines - all current and as amended, such as:

City of Ottawa Sewer Design Guidelines (**CoOSDG**) complete with ISTDB 2012-01, 2014-01, 2016-01 & 2018-01 technical bulletin updates as well as current Sewer, Landscape & Road Standard Detail Drawings as well as Material Specifications (MS Docs).
Sewer Connection (2003-513) & Sewer Use (2003-514) By-Laws.

City of Ottawa Water Distribution Design Guidelines (**CoOWDDG**) complete with ISTDB 2010-02, 2014-02 & 2018-02 technical bulletin updates as well as current Watermain/ Services Material Specifications (MS Docs) as well as Water and Road Standard Detail Drawings.
FUS Fire Flow standards
Water (2018-167) By-Law

Ensure to include version date and add "(as amended)" when referencing all standards, detail drwaings, by-Laws and guidelines.

Contact me at 613-580-2424, Ext. # 33017 or e-mail shawn.wessel@ottawa.ca if you have any questions.

Sincerely,

Shawn Wessel, A.Sc.T., rcji
Project Manager
Development Review, Central Branch

## Steve Matthews

**From:** Eric Lalande <eric.lalande@rvca.ca>
**Sent:** Wednesday, May 19, 2021 3:47 PM
**To:** Francois Thauvette
**Cc:** Steve Matthews
**Subject:** RE: 18 Louisa Street - RVCA Pre-Consultation

Hi Francois,

The RVCA would rely on municipal infrastructure to handle quality control. No requirements from our end for on-site SWM controls.

Thank you,

**Eric Lalande, MCIP, RPP**
Planner, RVCA
613-692-3571 x1137

---

**From:** Francois Thauvette <f.thauvette@novatech-eng.com>
**Sent:** Wednesday, May 19, 2021 2:35 PM
**To:** Eric Lalande <eric.lalande@rvca.ca>
**Cc:** Steve Matthews <S.Matthews@novatech-eng.com>
**Subject:** 18 Louisa Street - RVCA Pre-Consultation

Hi Eric,

We are working on a 9-storey residential development with underground parking located at 18 Louisa Street. Approximately half of the site (east side) is being re-developed and a portion of the existing site and building (west side) is to remain. Although the proposed re-development will include on-site stormwater quantity control measures, we assume there will be no requirement for stormwater quality control as the immediate receiver is the existing combined sewer in Louisa Street. This has been our experience on other projects located within a combined sewer area, in the City of Ottawa.

Please review and confirm if our assumption is correct.

Regards,

**François Thauvette**, P. Eng., Senior Project Manager | Land Development & Public Sector Engineering
**NOVATECH** Engineers, Planners & Landscape Architects
Please note that I am working from home. Email or MS Teams are the best ways to contact me.
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 219 | Cell: 613.276.0310 | Fax: 613.254.5867

# APPENDIX B

## Development Servicing Study Checklist

# Servicing study guidelines for development applications

## 4. Development Servicing Study Checklist

The following section describes the checklist of the required content of servicing studies. It is expected that the proponent will address each one of the following items for the study to be deemed complete and ready for review by City of Ottawa Infrastructure Approvals staff.

The level of required detail in the Servicing Study will increase depending on the type of application. For example, for Official Plan amendments and re-zoning applications, the main issues will be to determine the capacity requirements for the proposed change in land use and confirm this against the existing capacity constraint, and to define the solutions, phasing of works and the financing of works to address the capacity constraint. For subdivisions and site plans, the above will be required with additional detailed information supporting the servicing within the development boundary.

### 4.1 General Content

- ☐ Executive Summary (for larger reports only).
- ☒ Date and revision number of the report.
- ☒ Location map and plan showing municipal address, boundary, and layout of proposed development.
- ☒ Plan showing the site and location of all existing services.
- ☒ Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.
- ☒ Summary of Pre-consultation Meetings with City and other approval agencies.
- ☐ Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.
- ☒ Statement of objectives and servicing criteria.
- ☒ Identification of existing and proposed infrastructure available in the immediate area.
- ☐ Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).
- ☒ Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.
- ☐ Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.
- ☐ Proposed phasing of the development, if applicable.

☒ Reference to geotechnical studies and recommendations concerning servicing.

☒ All preliminary and formal site plan submissions should have the following information:
- Metric scale
- North arrow (including construction North)
- Key plan
- Name and contact information of applicant and property owner
- Property limits including bearings and dimensions
- Existing and proposed structures and parking areas
- Easements, road widening and rights-of-way
- Adjacent street names

### 4.2 Development Servicing Report: Water

☐ Confirm consistency with Master Servicing Study, if available
☒ Availability of public infrastructure to service proposed development
☒ Identification of system constraints
☒ Identify boundary conditions
☒ Confirmation of adequate domestic supply and pressure
☒ Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.
☒ Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.
☐ Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design
☒ Address reliability requirements such as appropriate location of shut-off valves
☐ Check on the necessity of a pressure zone boundary modification.
☒ Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range

- ☒ Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.
- ☐ Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.
- ☒ Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.
- ☒ Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.

### 4.3 Development Servicing Report: Wastewater

- ☒ Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).
- ☐ Confirm consistency with Master Servicing Study and/or justifications for deviations.
- ☒ Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.
- ☒ Description of existing sanitary sewer available for discharge of wastewater from proposed development.
- ☐ Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)
- ☐ Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix ‘C’) format.
- ☒ Description of proposed sewer network including sewers, pumping stations, and forcemains.
- ☐ Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).
- ☐ Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.
- ☐ Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.
- ☐ Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.
- ☒ Special considerations such as contamination, corrosive environment etc.

### 4.4 Development Servicing Report: Stormwater Checklist

- ☒ Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)
- ☒ Analysis of available capacity in existing public infrastructure.
- ☒ A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.
- ☒ Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.
- ☐ Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.
- ☒ Description of the stormwater management concept with facility locations and descriptions with references and supporting information.
- ☐ Set-back from private sewage disposal systems.
- ☐ Watercourse and hazard lands setbacks.
- ☒ Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.
- ☐ Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.
- ☒ Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).
- ☐ Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.
- ☒ Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.
- ☐ Any proposed diversion of drainage catchment areas from one outlet to another.
- ☒ Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.
- ☐ If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100 year return period storm event.
- ☒ Identification of potential impacts to receiving watercourses
- ☐ Identification of municipal drains and related approval requirements.
- ☒ Descriptions of how the conveyance and storage capacity will be achieved for the development.
- ☒ 100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.

- ☐ Inclusion of hydraulic analysis including hydraulic grade line elevations.
- ☒ Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.
- ☐ Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.
- ☐ Identification of fill constraints related to floodplain and geotechnical investigation.

### 4.5 Approval and Permit Requirements: Checklist

The Servicing Study shall provide a list of applicable permits and regulatory approvals necessary for the proposed development as well as the relevant issues affecting each approval. The approval and permitting shall include but not be limited to the following:

- ☐ Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement Act. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act.
- ☐ Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.
- ☐ Changes to Municipal Drains.
- ☐ Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)

### 4.6 Conclusion Checklist

- ☒ Clearly stated conclusions and recommendations
- ☐ Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.
- ☒ All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario

# APPENDIX C

## Theoretical Sanitary Flow Calculations

NOVATECH
Engineers, Planners & Landscape Architects



# 18 Louisa - 10-Storey Residential Development
## SANITARY SEWAGE ANALYSIS

| Residential | Post-Development | Units |
|---|---|---|
| Number of 1-Bedroom/Studio Units | 119 | |
| Number of Persons per 1-Bdrm Apartment | 1.4 | |
| Number of 2-Bedroom Units | 40 | |
| Number of Persons per 2-Bdrm Apartment | 2.1 | |
| Number of 3-Bedroom Units | 1 | |
| Number of Persons per 3-Bdrm Apartment | 3.1 | |
| Design Population | 254 | |
| Average Daily Flow per resident | 280 | L/c/day |
| Peak Factor (Harmon Formula) | 3.7 | |
| **Peak Residential Flow** | **3.06** | **L/s** |
| | | |
| **Extraneous Flow** | | |
| Site Area to be Developed | 0.185 | ha |
| Infiltration Allowance | 0.33 | L/s/ha |
| **Peak Extraneous Flows** | 0.06 | L/s |
| | | |
| **Total Peak Sanitary Flow** | **3.12** | **L/s** |

# APPENDIX D

## Water Demands, FUS Calculations, Boundary Conditions and E-mail Correspondence from the City of Ottawa

# 18 Louisa - Proposed Residential Development
# WATER ANALYSIS

## DOMESTIC WATER DEMAND

| Residential | Post-Development | Units |
|---|---|---|
| Number of 1-Bedroom/Studio Units | 119 | |
| Number of Persons per 1-Bdrm Apartment | 1.4 | |
| Number of 2-Bedroom Units | 40 | |
| Number of Persons per 2-Bdrm Apartment | 2.1 | |
| Number of 3-Bedroom Units | 1 | |
| Number of Persons per 3-Bdrm Apartment | 3.1 | |
| Design Population | 254 | |
| Average Daily Flow per resident | 280 | L/c/day |
| **Average Day Demand** | **0.82** | **L/s** |
| **Maximum Day Demand (2.5 x avg. day)** | **2.06** | **L/s** |
| **Peak Hour Demand (2.2 x max. day)** | **4.53** | **L/s** |
| | | |
| **TOTALS** | | |
| **Average Day Demand** | **0.82** | **L/s** |
| **Maximum Day Demand** | **2.06** | **L/s** |
| **Peak Hour Demand** | **4.53** | **L/s** |

## BOUNDAY CONDITIONS (Values provided by the City of Ottawa)

| | | |
|---|---|---|
| Maximum HGL = | 115.3 | 115.3 m |
| Minimum HGL = | 107.1 | 107.1 m |
| Max Day + Fire Flow | 105.6 | 105.9 m |

## PRESSURE TESTS

To convert Head(m) to PSI: multiply by 1.42

Approx. Street Elevation (at service connection) 71.6 71.6 m

High Pressure Test = (Max HGL - Avg.Ground Elev.) x 1.42197 PSI/m > 50 PSI and < 70 PSI

High Pressure = **62.1 psi**

Low Pressure Test = (Min. HGL - Avg. Ground Elev.) x 1.42197 PSI/m > 40 PSI

Low Pressure = **50.5 psi**

Max Day + Fire Flow Test = (Max Day + Fire Flow - Avg. Ground Elev.) x 1.42197 PSI/m > 20 PSI

MD + FF Pressure= **48.8 psi**

# FUS - Fire Flow Calculations

NOVATECH
Engineers, Planners & Landscape Architects

**Novatech Project #:** 120206
**Project Name:** 18 Louisa Street
**Date:** 28/06/2024
**Input By:** K. D'sa
**Reviewed By:** F. Thauvette
**Drawing Reference:**

**Legend:** Input by User
No Input Required
**Reference:** Fire Underwriter's Survey Guideline (2020)
Formula Method

**Building Description:** Existing 3-Storey Building
**Type II - Non-combustible construction**

| Step | | | Choose | | Value Used | Total Fire Flow (L/min) |
|---|---|---|---|---|---|---|
| **Base Fire Flow** | | | | | | |
| 1 | **Construction Material** | | | **Multiplier** | | |
| | **Coefficient related to type of construction** **C** | Type V - Wood frame | | 1.5 | 0.8 | |
| | | Type IV - Mass Timber | | Varies | | |
| | | Type III - Ordinary construction | | 1 | | |
| | | Type II - Non-combustible construction | Yes | 0.8 | | |
| | | Type I - Fire resistive construction (2 hrs) | | 0.6 | | |
| 2 | **Floor Area** | | | | | |
| | **A** | Building Footprint ($m^2$) | 839 | | | |
| | | Number of Floors/Storeys | 3 | | | |
| | | Protected Openings (1 hr) if C<1.0 | | | | |
| | | Area of structure considered ($m^2$) | | | **2,098** | |
| | **F** | **Base fire flow without reductions** | | | | **8,000** |
| | | $F = 220\ C\ (A)^{0.5}$ | | | | |
| **Reductions or Surcharges** | | | | | | |
| 3 | **Occupancy hazard reduction or surcharge** | | **FUS Table 3** | **Reduction/Surcharge** | | |
| | (1) | Non-combustible | | -25% | -15% | **6,800** |
| | | Limited combustible | Yes | -15% | | |
| | | Combustible | | 0% | | |
| | | Free burning | | 15% | | |
| | | Rapid burning | | 25% | | |
| 4 | **Sprinkler Reduction** | | **FUS Table 4** | **Reduction** | | |
| | (2) | Adequately Designed System (NFPA 13) | Yes | -30% | -30% | **-2,720** |
| | | Standard Water Supply | Yes | -10% | -10% | |
| | | Fully Supervised System | | -10% | | |
| | | | | **Cumulative Sub-Total** | **-40%** | |
| | | **Area of Sprinklered Coverage ($m^2$)** | 2517 | 100% | | |
| | | | | **Cumulative Total** | **-40%** | |
| 5 | **Exposure Surcharge** | | **FUS Table 5** | | **Surcharge** | |
| | (3) | North Side | 20.1 - 30 m | | 10% | **3,060** |
| | | East Side | 2Hr Firewall | | 0% | |
| | | South Side | 10.1 - 20 m | | 15% | |
| | | West Side | 3.1 - 10 m | | 20% | |
| | | | | **Cumulative Total** | **45%** | |
| **Results** | | | | | | |
| 6 | (1) + (2) + (3) | **Total Required Fire Flow, rounded to nearest 1000L/min** | | | **L/min** | **7,000** |
| | | (2,000 L/min < Fire Flow < 45,000 L/min) | | or | L/s | **117** |
| | | | | or | USGPM | 1,849 |

# FUS - Fire Flow Calculations

Engineers, Planners & Landscape Architects

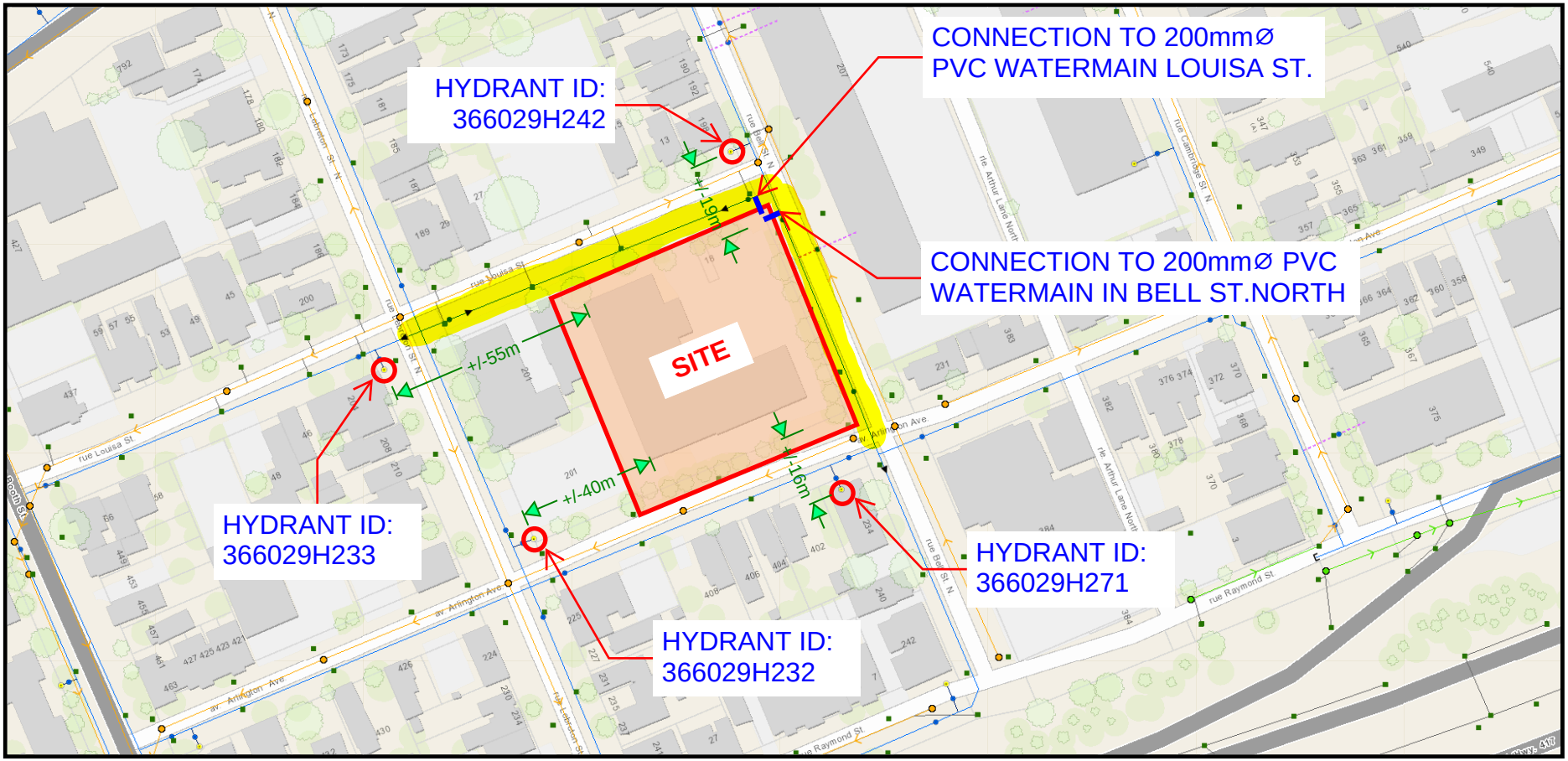
**Novatech Project #:** 120206
**Project Name:** 18 Louisa Street
**Date:** 28/06/2024
**Input By:** K. D'sa
**Reviewed By:** F. Thauvette
**Drawing Reference:**

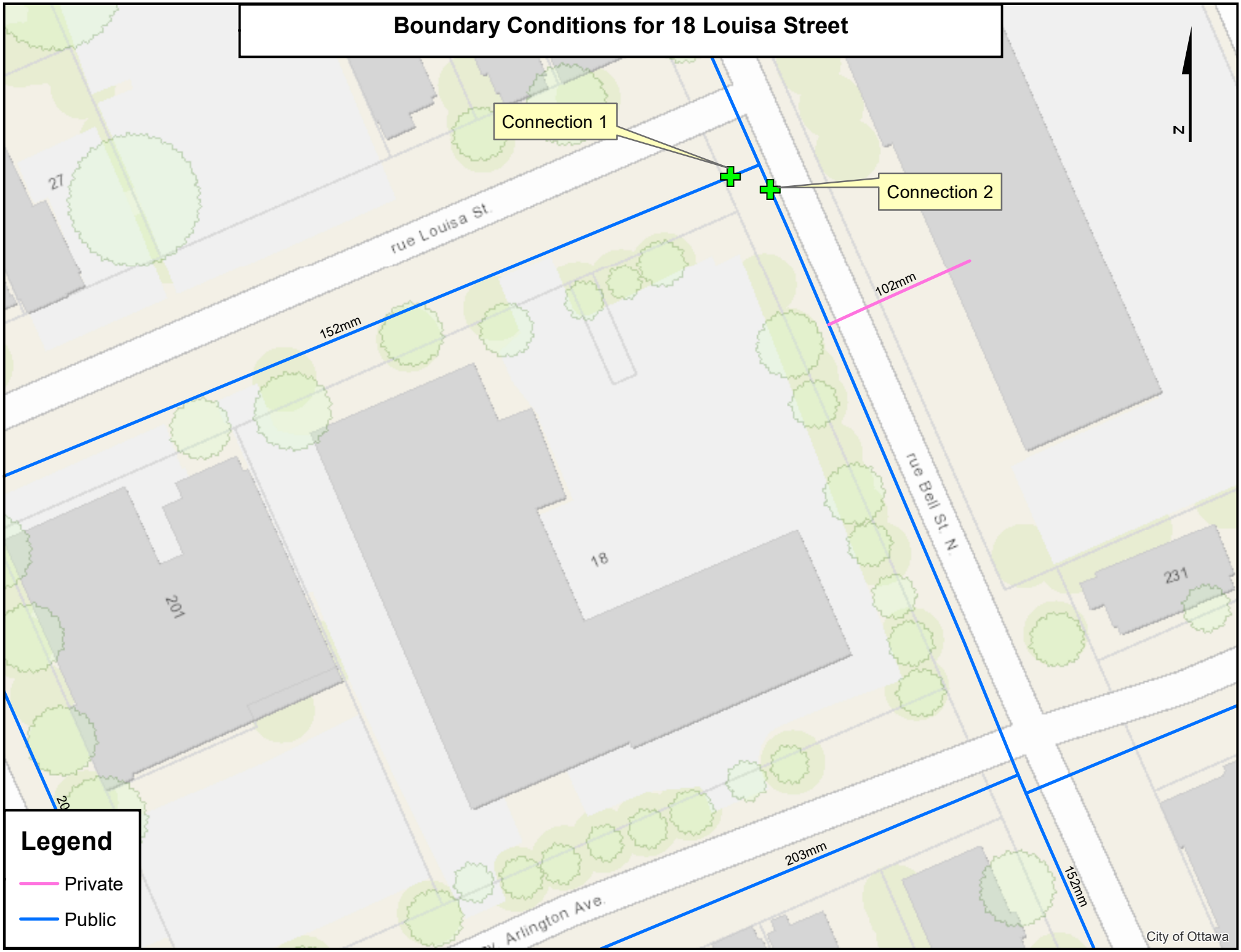
**Legend:** Input by User / No Input Required
**Reference:** Fire Underwriter's Survey Guideline (2020) Formula Method

**Building Description:** Proposed 10-Storey Building
**Type II - Non-combustible construction**

| Step | | | Choose | | Value Used | Total Fire Flow (L/min) |
|---|---|---|---|---|---|---|
| **Base Fire Flow** | | | | | | |
| 1 | **Construction Material** | | | **Multiplier** | | |
| | **Coefficient related to type of construction C** | Type V - Wood frame | | 1.5 | 0.8 | |
| | | Type IV - Mass Timber | | Varies | | |
| | | Type III - Ordinary construction | | 1 | | |
| | | Type II - Non-combustible construction | Yes | 0.8 | | |
| | | Type I - Fire resistive construction (2 hrs) | | 0.6 | | |
| 2 | **Floor Area** | | | | | |
| | **A** | Building Footprint ($m^2$) | 1225 | | | |
| | | Number of Floors/Storeys | 10 | | | |
| | | Protected Openings (1 hr) if C<1.0 | | | | |
| | | Area of structure considered ($m^2$) | | | **7,350** | |
| | **F** | **Base fire flow without reductions** | | | | **15,000** |
| | | $F = 220\ C\ (A)^{0.5}$ | | | | |
| **Reductions or Surcharges** | | | | | | |
| 3 | **Occupancy hazard reduction or surcharge** | | **FUS Table 3** | **Reduction/Surcharge** | | |
| | **(1)** | Non-combustible | | -25% | -15% | **12,750** |
| | | Limited combustible | Yes | -15% | | |
| | | Combustible | | 0% | | |
| | | Free burning | | 15% | | |
| | | Rapid burning | | 25% | | |
| 4 | **Sprinkler Reduction** | | **FUS Table 4** | **Reduction** | | |
| | **(2)** | Adequately Designed System (NFPA 13) | Yes | -30% | -30% | **-5,100** |
| | | Standard Water Supply | Yes | -10% | -10% | |
| | | Fully Supervised System | No | -10% | | |
| | | | | **Cumulative Sub-Total** | **-40%** | |
| | | **Area of Sprinklered Coverage ($m^2$)** | 12250 | 100% | | |
| | | | | **Cumulative Total** | **-40%** | |
| 5 | **Exposure Surcharge** | | **FUS Table 5** | | **Surcharge** | |
| | **(3)** | North Side | 20.1 - 30 m | | 10% | **3,825** |
| | | East Side | 20.1 - 30 m | | 10% | |
| | | South Side | 20.1 - 30 m | | 10% | |
| | | West Side | 2Hr Firewall | | 0% | |
| | | | | **Cumulative Total** | **30%** | |
| **Results** | | | | | | |
| 6 | **(1) + (2) + (3)** | **Total Required Fire Flow, rounded to nearest 1000L/min** | | | **L/min** | **11,000** |
| | | (2,000 L/min < Fire Flow < 45,000 L/min) | | or | L/s | **183** |
| | | | | or | USGPM | 2,906 |

# EXISTING INFRASTRUCTURE




Boundary Conditions for 18 Louisa Street
Connection 1
Connection 2
N
rue Louisa St.
152mm
102mm
rue Bell St. N.
18
201
231
27
Arlington Ave.
203mm
152mm
Legend
Private
Public
City of Ottawa

**Kynan Dsa**

---

**From:** Wessel, Shawn <shawn.wessel@ottawa.ca>
**Sent:** Friday, July 19, 2024 8:55 AM
**To:** Francois Thauvette
**Cc:** Patricia Warren; Wayne Jennings (wjennings@wkjdevelopment.com); Brian Casagrande; Chris Packman
**Subject:** RE: 24 06 28 - 18 Louisa St - SPA Watermain Boundary Conditions
**Attachments:** 18 Louisa Street July 2024.pdf

Good morning, Francois.

Please find requested BC, attached and below:

The following are boundary conditions, HGL, for hydraulic analysis at 18 Louisa Street (zone 1W) assumed to via two connections to connections to 203mm watermain on Louisa Street and 203mm watermain on Bell Street (see attached PDF for location).

Both connections:

Minimum HGL: 107.1 m

Maximum HGL: 115.3m

May Day + Fire Flow (183 L/s): 105.6m (Connection 1), 105.9m (Connection 2)

These are for current conditions and are based on computer model simulation.

*Disclaimer: The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation.*

If you require additional information or clarification, please do not hesitate to contact me anytime.

Thank you

***Regards,***

**Shawn Wessel, A.Sc.T.,rcji**
Pronouns: he/him | Pronom: il

**Project Manager - Infrastructure Approvals**
**Gestionnaire de projet – Approbation des demandes d'infrastructures**

**Development Review Central Branch | Direction de l'examen des projets d'aménagement, Centrale**
**Planning, Development & Building Services Department (PDBS) | Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)**
**City of Ottawa | Ville d'Ottawa**
**110 Laurier Ave. W. | 110, avenue Laurier Ouest, Ottawa ON K1P 1J1**
**(613) 580 2424 Ext. | Poste 33017**
**Int. Mail Code | Code de Courrier Interne 01-14**
**shawn.wessel@ottawa.ca**

Please consider the environment before printing this email

**Please note that I will be away August 9-11th inclusive, returning the 12th. For all urgent matters, please contact the project File Lead and/or Sr. Engineer.**
**Please also note that I will be away Aug 28-30 inclusive, returning Monday Sept. 2nd.**

*****Please also note that, while my work hours may be affected by the current situation and am working from home, I still have access to email, video conferencing and telephone. Feel free to schedule video conferences and/or telephone calls, as necessary.*****

---

**From:** Chris Packman <cpackman@jenningsdevelopments.com>
**Sent:** Friday, June 28, 2024 9:53 AM
**To:** Bernier, John <John.Bernier@ottawa.ca>
**Cc:** Wessel, Shawn <shawn.wessel@ottawa.ca>; Patricia Warren <warren@fotenn.com>; Wayne Jennings (wjennings@wkjdevelopment.com) <wjennings@wkjdevelopment.com>; Francois Thauvette <f.thauvette@novatech-eng.com>; Brian Casagrande <casagrande@fotenn.com>
**Subject:** 24 06 28 - 18 Louisa St - SPA Watermain Boundary Conditions



Hi John,

Jennings Developments / Fotenn will be looking to submit our required documents to resubmit for site plan approval as discussed in the attached thread.

In speaking with Francois (Novatech), we are assuming there will need to be new watermain boundary conditions requested, please advise if not.

Additionally, we are wondering if Shawn Wessel is still the city engineer on the file? If not, could you please confirm who we should contact for requesting new boundary conditions?

Much appreciated,
Thanks,

**Chris Packman** | Project Manager

JENNINGS
REAL ESTATE
Suite 402, 141 Laurier Ave W
Ottawa, ON K1P 5J3
C: 343-996-1966
cpackman@jenningsdevelopments.com

'



'

## Kynan Dsa

**From:** Wessel, Shawn <shawn.wessel@ottawa.ca>
**Sent:** Tuesday, July 2, 2024 10:29 AM
**To:** Francois Thauvette
**Cc:** Kynan Dsa
**Subject:** RE: 18 Louisa Street - Request for WM Boundary Conditions (120206)

Thank you for your email Francois.

Your request has been forwarded to the Water Dept.

Enjoy your day!

***Regards,***


**Shawn Wessel, A.Sc.T.,rcji**
Pronouns: he/him | Pronom: il
**Project Manager - Infrastructure Approvals**
**Gestionnaire de projet – Approbation des demandes d'infrastructures**

**Development Review Central Branch | Direction de l'examen des projets d'aménagement, Centrale**
**Planning, Development & Building Services Department (PDBS) | Direction générale des services de la planification, de l'aménagement et du bàtiment (DGSPAB)**
**City of Ottawa | Ville d'Ottawa**
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**(613) 580 2424 Ext. | Poste 33017**
**Int. Mail Code | Code de Courrier Interne 01-14**
**shawn.wessel@ottawa.ca**




**Please note that I will be away August 9-11th, returning the 12th. For all urgent matters, please contact the project File Lead and/or Sr. Engineer.**

*****Please also note that, while my work hours may be affected by the current situation and am working from home, I still have access to email, video conferencing and telephone. Feel free to schedule video conferences and/or telephone calls, as necessary.*****

---

**From:** Francois Thauvette <f.thauvette@novatech-eng.com>
**Sent:** Tuesday, July 2, 2024 10:22 AM
**To:** Wessel, Shawn <shawn.wessel@ottawa.ca>
**Cc:** Kynan Dsa <k.dsa@novatech-eng.com>
**Subject:** FW: 18 Louisa Street - Request for WM Boundary Conditions (120206)

Hi Shawn,

We are sending this e-mail to request UPDATED watermain boundary conditions for the proposed re-development of the 18 Louisa Street property. See e-mail below and attachments for details.

Regards,

**François Thauvette**, P. Eng., Sr. Project Manager | Land Development & Public-Sector Engineering
**NOVATECH**
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | T: 613.254.9643 Ext: 219 | C: 613.276.0310


---

**From:** Kynan Dsa <k.dsa@novatech-eng.com>
**Sent:** Tuesday, July 2, 2024 9:58 AM
**To:** Francois Thauvette <f.thauvette@novatech-eng.com>
**Subject:** 18 Louisa Street - Request for WM Boundary Conditions (120206)

Hi François,

Please find attached the updated supporting documents for the request for WM Boundary Conditions at 18 Louisa Street as we recommence the process for site plan approval. The intent is to retain the existing 3-storey building and paved laneway (western portion of the site) and to demolish the existing building and large surface parking lot (eastern portion of the site). The revised proposal seeks to construct a new 10-storey residential building instead of the previously communicated 9-storey residential building. The existing building (east side) will retain its existing service laterals and new service laterals will be installed for the proposed 10-storey residential building (west side), consistent with the previous design approach.

The purpose of this email is to request UPDATED watermain boundary conditions for both 200 dia. watermains in Louisa and Bell Streets (as shown on geoOttawa). We anticipate requiring two (2) water service connections, due to the high domestic demands. The anticipated water demands for the proposed 10-storey residential building are as follows:

- Average Day Demand = 0.83 L/s
- Maximum Day Demand = 2.07 L/s
- Peak Hour Demand = 4.55 L/s
- Maximum Fire Flow Demand Range = 117-183 L/s (Ex. Building & New Building)

See attached calculation sheets for details.

A multi-hydrant approach to firefighting is anticipated to be required. As indicated on the geoOttawa website, there are several blue bonnet municipal hydrants within 150m of the subject site that could be used for firefighting purposes. See attached **WM Boundary Conditions Figure** for details.

Please review and let me know if you require any additional information.

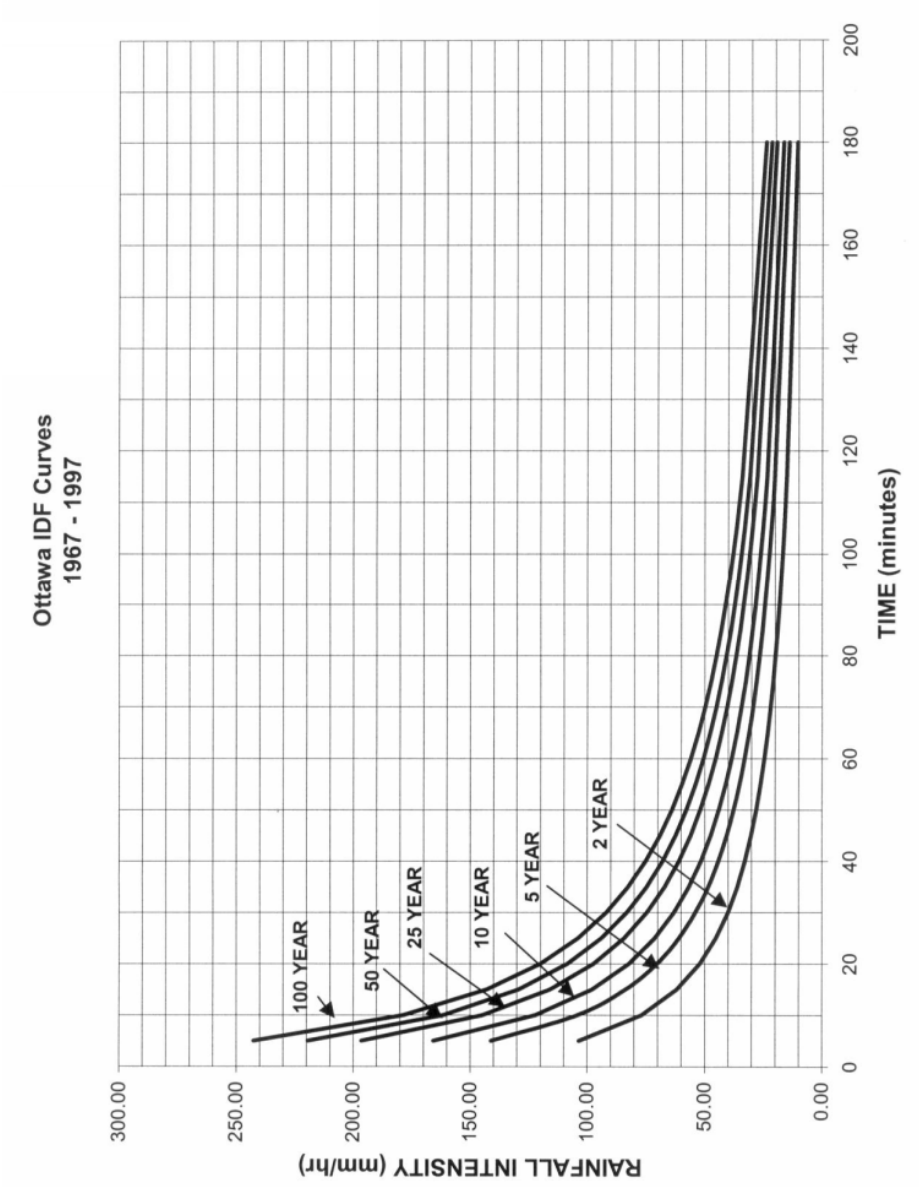
Thanks,

**Kynan D'sa**, B.A.Sc. (Engineering) (He/Him)
**NOVATECH**
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6
Tel: 613.254.9643

# APPENDIX E

## IDF Curves and SWM Calculations

APPENDIX 5-A OTTAWA INTENSITY DURATION FREQUENCY (IDF) CURVE



PROJECT #: 120206
PROJECT NAME: 18 LOUISA STREET
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: 8/1/2024

# Proposed 10-Storey Residential Building
# 18 Louisa Street

| Pre - Development | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Description | Area (ha) | $A_{impervious}$ (ha) C=0.9 | $A_{planters}$ (ha) C=0.6 | $A_{pervious}$ (ha) C=0.2 | Weighted $C_{w5}$ | Weighted $C_{w100}$ | 1:5 Year Flow (L/s) | 1:100 Year Flow (L/s) | Allowable $C_{value}$ | Allowable Flow 2 year (L/s) |
| Portion of Site to be Re-Developed | 0.191 | 0.175 | 0.003 | 0.013 | 0.85 | 0.95 | 46.9 | 89.6 | 0.5 | 20.4 |
| | | | | | | | | | C=0.5 (Max.) | |

| Post - Development : Site Flows if the areas were left Uncontrolled | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Area | Description | Area (ha) | $A_{imp}$ (ha) C=0.9 | $A_{planters}$ (ha) C=0.6 | $A_{perv}$ (ha) C=0.2 | $C_5$ | $C_{100}$ | Uncontrolled Flow (L/s) 5 year | Uncontrolled Flow (L/s) 100 year |
| A-1 | Direct Runoff | 0.036 | 0.024 | 0.008 | 0.004 | 0.62 | 0.69 | 6.5 | 12.4 |
| A-2 | Controlled Internal SWM Tank | 0.155 | 0.149 | 0.003 | 0.003 | 0.87 | 0.97 | 39.0 | 74.4 |
| | | 0.191 | | | | | $T_c$ = 10mins | $T_c$ = 10mins | |

| Post - Development : Total Flows for Controlled Site + Uncontrolled Runoff | | | | | | |
|---|---|---|---|---|---|---|
| Area | Description | Flow (L/s) 5 year | Flow (L/s) 100 year | Storage Required ($m^3$) 5 year | Storage Required ($m^3$) 100 year | Provided ($m^3$) |
| A-1 | Direct Runoff | 6.5 | 12.4 | - | - | - |
| A-2 | Controlled Internal SWM Tank | 4.5 | 4.5 | 28.9 | 68.3 | > 69 |
| | **Totals :** | **11.0** | **16.9** | **28.9** | **68.3** | **>69** |
| | Over Controlled: | 9.4 | 3.5 | Excess flow restriction required for sanitary + groundwater contribution to combined sewer | | |

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**Proposed Residential Development**
**Novatech Project No. 120206**
**REQUIRED STORAGE - 1:2 YEAR EVENT**
**AREA A-1 Uncontrolled Runoff**

OTTAWA IDF CURVE

| | | | | | |
|---|---|---|---|---|---|
| Area = | 0.036 | ha | Qallow = | 4.8 | L/s |
| C = | 0.62 | | Vol(max) = | 0.0 | m3 |

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|---|---|---|---|---|
| 5 | 103.57 | 6.45 | 1.67 | 0.50 |
| 10 | 76.81 | 4.78 | 0.00 | 0.00 |
| 15 | 61.77 | 3.85 | -0.94 | -0.84 |
| 20 | 52.03 | 3.24 | -1.54 | -1.85 |
| 25 | 45.17 | 2.81 | -1.97 | -2.96 |
| 30 | 40.04 | 2.49 | -2.29 | -4.12 |
| 35 | 36.06 | 2.25 | -2.54 | -5.33 |
| 40 | 32.86 | 2.05 | -2.74 | -6.57 |
| 45 | 30.24 | 1.88 | -2.90 | -7.83 |
| 50 | 28.04 | 1.75 | -3.04 | -9.11 |
| 55 | 26.17 | 1.63 | -3.15 | -10.41 |
| 60 | 24.56 | 1.53 | -3.25 | -11.71 |
| 65 | 23.15 | 1.44 | -3.34 | -13.03 |
| 70 | 21.91 | 1.36 | -3.42 | -14.36 |
| 75 | 20.81 | 1.30 | -3.49 | -15.69 |
| 90 | 18.14 | 1.13 | -3.65 | -19.73 |
| 105 | 16.13 | 1.00 | -3.78 | -23.80 |
| 120 | 14.56 | 0.91 | -3.88 | -27.91 |
| 135 | 13.30 | 0.83 | -3.95 | -32.03 |
| 150 | 12.25 | 0.76 | -4.02 | -36.18 |

**Proposed Residential Development**
**Novatech Project No. 120206**
**REQUIRED STORAGE - 1:5 YEAR EVENT**
**AREA A-1 Uncontrolled Runoff**

OTTAWA IDF CURVE

| | | | | | |
|---|---|---|---|---|---|
| Area = | 0.036 | ha | Qallow = | 6.5 | L/s |
| C = | 0.62 | | Vol(max) = | 0.0 | m3 |

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|---|---|---|---|---|
| 5 | 141.18 | 8.79 | 2.30 | 0.69 |
| 10 | 104.19 | 6.49 | 0.00 | 0.00 |
| 15 | 83.56 | 5.20 | -1.29 | -1.16 |
| 20 | 70.25 | 4.37 | -2.11 | -2.54 |
| 25 | 60.90 | 3.79 | -2.70 | -4.04 |
| 30 | 53.93 | 3.36 | -3.13 | -5.63 |
| 35 | 48.52 | 3.02 | -3.47 | -7.28 |
| 40 | 44.18 | 2.75 | -3.74 | -8.97 |
| 45 | 40.63 | 2.53 | -3.96 | -10.69 |
| 50 | 37.65 | 2.34 | -4.14 | -12.43 |
| 55 | 35.12 | 2.19 | -4.30 | -14.19 |
| 60 | 32.94 | 2.05 | -4.44 | -15.97 |
| 65 | 31.04 | 1.93 | -4.56 | -17.77 |
| 70 | 29.37 | 1.83 | -4.66 | -19.57 |
| 75 | 27.89 | 1.74 | -4.75 | -21.38 |
| 90 | 24.29 | 1.51 | -4.98 | -26.87 |
| 105 | 21.58 | 1.34 | -5.14 | -32.41 |
| 120 | 19.47 | 1.21 | -5.28 | -37.99 |
| 135 | 17.76 | 1.11 | -5.38 | -43.59 |
| 150 | 16.36 | 1.02 | -5.47 | -49.22 |

**Proposed Residential Development**
**Novatech Project No. 120206**
**REQUIRED STORAGE - 1:100 YEAR EVENT**
**AREA A-1 Uncontrolled Runoff**

OTTAWA IDF CURVE

| | | | | | |
|---|---|---|---|---|---|
| Area = | 0.036 | ha | Qallow = | 11.1 | L/s |
| C = | 0.62 | | Vol(max) = | 0.0 | m3 |

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|---|---|---|---|---|
| 5 | 242.70 | 15.11 | 3.99 | 1.20 |
| 10 | 178.56 | 11.12 | 0.00 | 0.00 |
| 15 | 142.89 | 8.90 | -2.22 | -2.00 |
| 20 | 119.95 | 7.47 | -3.65 | -4.38 |
| 25 | 103.85 | 6.47 | -4.65 | -6.98 |
| 30 | 91.87 | 5.72 | -5.40 | -9.72 |
| 35 | 82.58 | 5.14 | -5.98 | -12.55 |
| 40 | 75.15 | 4.68 | -6.44 | -15.46 |
| 45 | 69.05 | 4.30 | -6.82 | -18.41 |
| 50 | 63.95 | 3.98 | -7.14 | -21.41 |
| 55 | 59.62 | 3.71 | -7.41 | -24.44 |
| 60 | 55.89 | 3.48 | -7.64 | -27.50 |
| 65 | 52.65 | 3.28 | -7.84 | -30.58 |
| 70 | 49.79 | 3.10 | -8.02 | -33.68 |
| 75 | 47.26 | 2.94 | -8.18 | -36.79 |
| 90 | 41.11 | 2.56 | -8.56 | -46.22 |
| 105 | 36.50 | 2.27 | -8.85 | -55.73 |
| 120 | 32.89 | 2.05 | -9.07 | -65.31 |
| 135 | 30.00 | 1.87 | -9.25 | -74.94 |
| 150 | 27.61 | 1.72 | -9.40 | -84.60 |

**Proposed Residential Development**
**Novatech Project No. 120206**
**REQUIRED STORAGE - 1:100 YR + 20% IDF Increase**
**AREA A-1 Uncontrolled Runoff**

OTTAWA IDF CURVE

| | | | | | |
|---|---|---|---|---|---|
| Area = | 0.036 | ha | Qallow = | 13.3 | L/s |
| C = | 0.62 | | Vol(max) = | 0.0 | m3 |

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|---|---|---|---|---|
| 5 | 291.24 | 18.14 | 4.79 | 1.44 |
| 10 | 214.27 | 13.34 | 0.00 | 0.00 |
| 15 | 171.47 | 10.68 | -2.67 | -2.40 |
| 20 | 143.94 | 8.96 | -4.38 | -5.26 |
| 25 | 124.62 | 7.76 | -5.58 | -8.37 |
| 30 | 110.24 | 6.86 | -6.48 | -11.66 |
| 35 | 99.09 | 6.17 | -7.17 | -15.06 |
| 40 | 90.17 | 5.62 | -7.73 | -18.55 |
| 45 | 82.86 | 5.16 | -8.18 | -22.09 |
| 50 | 76.74 | 4.78 | -8.56 | -25.69 |
| 55 | 71.55 | 4.46 | -8.89 | -29.33 |
| 60 | 67.07 | 4.18 | -9.17 | -33.00 |
| 65 | 63.18 | 3.93 | -9.41 | -36.70 |
| 70 | 59.75 | 3.72 | -9.62 | -40.41 |
| 75 | 56.71 | 3.53 | -9.81 | -44.15 |
| 90 | 49.33 | 3.07 | -10.27 | -55.46 |
| 105 | 43.80 | 2.73 | -10.62 | -66.88 |
| 120 | 39.47 | 2.46 | -10.88 | -78.37 |
| 135 | 36.00 | 2.24 | -11.10 | -89.92 |
| 150 | 33.13 | 2.06 | -11.28 | -101.52 |

PROJECT #: 120206
PROJECT NAME: 18 LOUISA STREET
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: 8/1/2024

**Proposed Residential Development**
**Novatech Project No. 120206**
**REQUIRED STORAGE - 1:2 YEAR EVENT**
**AREA A-2 Controlled Flow-Internal SWM Tank**

OTTAWA IDF CURVE

Area = 0.155 ha Qallow = 4.5 L/s
C = 0.87 Vol(max) = 18.9 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|---|---|---|---|---|
| 5 | 103.57 | 38.78 | 34.28 | 10.29 |
| 10 | 76.81 | 28.76 | 24.26 | 14.56 |
| 15 | 61.77 | 23.13 | 18.63 | 16.77 |
| 20 | 52.03 | 19.48 | 14.98 | 17.98 |
| 25 | 45.17 | 16.91 | 12.41 | 18.62 |
| 30 | 40.04 | 14.99 | 10.49 | 18.89 |
| 35 | 36.06 | 13.50 | 9.00 | 18.91 |
| 40 | 32.86 | 12.31 | 7.81 | 18.74 |
| 45 | 30.24 | 11.32 | 6.82 | 18.42 |
| 50 | 28.04 | 10.50 | 6.00 | 18.00 |
| 55 | 26.17 | 9.80 | 5.30 | 17.49 |
| 60 | 24.56 | 9.20 | 4.70 | 16.91 |
| 65 | 23.15 | 8.67 | 4.17 | 16.26 |
| 70 | 21.91 | 8.21 | 3.71 | 15.56 |
| 75 | 20.81 | 7.79 | 3.29 | 14.82 |
| 90 | 18.14 | 6.79 | 2.29 | 12.39 |
| 105 | 16.13 | 6.04 | 1.54 | 9.71 |
| 120 | 14.56 | 5.45 | 0.95 | 6.86 |
| 135 | 13.30 | 4.98 | 0.48 | 3.88 |
| 150 | 12.25 | 4.59 | 0.09 | 0.79 |

**Proposed Residential Development**
**Novatech Project No. 120206**
**REQUIRED STORAGE - 1:5 YEAR EVENT**
**AREA A-2 Controlled Flow-Internal SWM Tank**

OTTAWA IDF CURVE

Area = 0.155 ha Qallow = 4.5 L/s
C = 0.87 Vol(max) = 28.9 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|---|---|---|---|---|
| 5 | 141.18 | 52.87 | 48.37 | 14.51 |
| 10 | 104.19 | 39.02 | 34.52 | 20.71 |
| 15 | 83.56 | 31.29 | 26.79 | 24.11 |
| 20 | 70.25 | 26.31 | 21.81 | 26.17 |
| 25 | 60.90 | 22.80 | 18.30 | 27.46 |
| 30 | 53.93 | 20.19 | 15.69 | 28.25 |
| 35 | 48.52 | 18.17 | 13.67 | 28.70 |
| 40 | 44.18 | 16.55 | 12.05 | 28.91 |
| 45 | 40.63 | 15.21 | 10.71 | 28.93 |
| 50 | 37.65 | 14.10 | 9.60 | 28.80 |
| 55 | 35.12 | 13.15 | 8.65 | 28.55 |
| 60 | 32.94 | 12.34 | 7.84 | 28.21 |
| 65 | 31.04 | 11.62 | 7.12 | 27.79 |
| 70 | 29.37 | 11.00 | 6.50 | 27.29 |
| 75 | 27.89 | 10.44 | 5.94 | 26.74 |
| 90 | 24.29 | 9.10 | 4.60 | 24.81 |
| 105 | 21.58 | 8.08 | 3.58 | 22.57 |
| 120 | 19.47 | 7.29 | 2.79 | 20.09 |
| 135 | 17.76 | 6.65 | 2.15 | 17.43 |
| 150 | 16.36 | 6.13 | 1.63 | 14.64 |

**Proposed Residential Development**
**Novatech Project No. 120206**
**REQUIRED STORAGE - 1:100 YEAR EVENT**
**AREA A-2 Controlled Flow-Internal SWM Tank**

OTTAWA IDF CURVE

Area = 0.155 ha Qallow = 4.5 L/s
C = 0.97 Vol(max) = 68.3 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|---|---|---|---|---|
| 5 | 242.70 | 101.04 | 96.54 | 28.96 |
| 10 | 178.56 | 74.34 | 69.84 | 41.90 |
| 15 | 142.89 | 59.49 | 54.99 | 49.49 |
| 20 | 119.95 | 49.94 | 45.44 | 54.52 |
| 25 | 103.85 | 43.23 | 38.73 | 58.10 |
| 30 | 91.87 | 38.25 | 33.75 | 60.74 |
| 35 | 82.58 | 34.38 | 29.88 | 62.74 |
| 40 | 75.15 | 31.28 | 26.78 | 64.28 |
| 45 | 69.05 | 28.75 | 24.25 | 65.46 |
| 50 | 63.95 | 26.62 | 22.12 | 66.37 |
| 55 | 59.62 | 24.82 | 20.32 | 67.06 |
| 60 | 55.89 | 23.27 | 18.77 | 67.57 |
| 65 | 52.65 | 21.92 | 17.42 | 67.93 |
| 70 | 49.79 | 20.73 | 16.23 | 68.16 |
| 75 | 47.26 | 19.67 | 15.17 | 68.28 |
| 90 | 41.11 | 17.11 | 12.61 | 68.12 |
| 105 | 36.50 | 15.19 | 10.69 | 67.37 |
| 120 | 32.89 | 13.69 | 9.19 | 66.20 |
| 135 | 30.00 | 12.49 | 7.99 | 64.70 |
| 150 | 27.61 | 11.49 | 6.99 | 62.95 |

**Proposed Residential Development**
**Novatech Project No. 120206**
**REQUIRED STORAGE - 1:100 YR + 20% IDF Increase**
**AREA A-2 Controlled Flow-Internal SWM Tank**

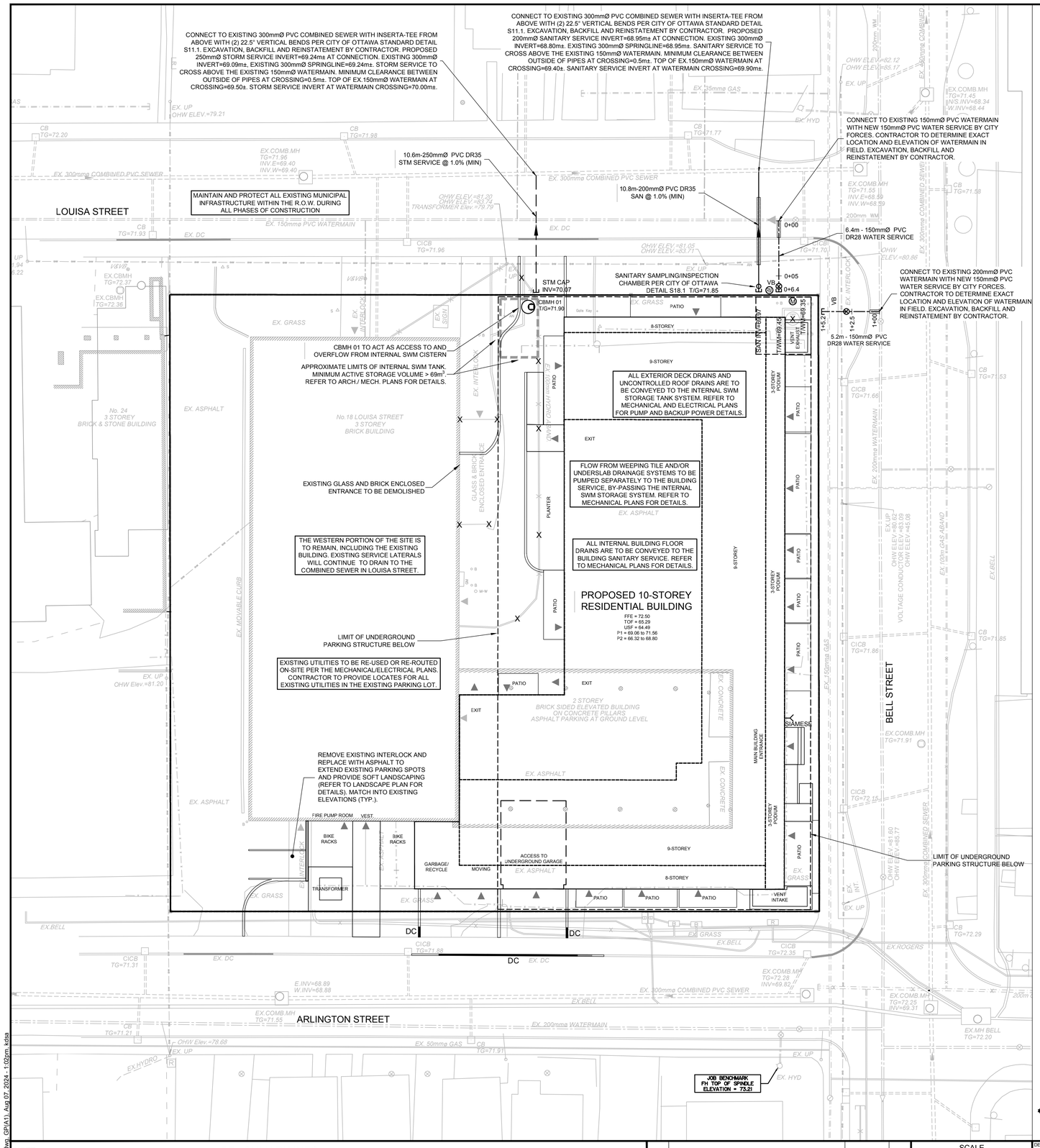
OTTAWA IDF CURVE

Area = 0.155 ha Qallow = 4.5 L/s
C = 0.97 Vol(max) = 86.6 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|---|---|---|---|---|
| 5 | 291.24 | 121.25 | 116.75 | 35.02 |
| 10 | 214.27 | 89.20 | 84.70 | 50.82 |
| 15 | 171.47 | 71.39 | 66.89 | 60.20 |
| 20 | 143.94 | 59.92 | 55.42 | 66.51 |
| 25 | 124.62 | 51.88 | 47.38 | 71.07 |
| 30 | 110.24 | 45.89 | 41.39 | 74.51 |
| 35 | 99.09 | 41.25 | 36.75 | 77.18 |
| 40 | 90.17 | 37.54 | 33.04 | 79.30 |
| 45 | 82.86 | 34.50 | 30.00 | 80.99 |
| 50 | 76.74 | 31.95 | 27.45 | 82.35 |
| 55 | 71.55 | 29.79 | 25.29 | 83.44 |
| 60 | 67.07 | 27.92 | 23.42 | 84.32 |
| 65 | 63.18 | 26.30 | 21.80 | 85.02 |
| 70 | 59.75 | 24.87 | 20.37 | 85.57 |
| 75 | 56.71 | 23.61 | 19.11 | 85.98 |
| 90 | 49.33 | 20.54 | 16.04 | 86.60 |
| 105 | 43.80 | 18.23 | 13.73 | 86.52 |
| 120 | 39.47 | 16.43 | 11.93 | 85.92 |
| 135 | 36.00 | 14.99 | 10.49 | 84.93 |
| 150 | 33.13 | 13.79 | 9.29 | 83.64 |

# APPENDIX F

## Engineering Plans

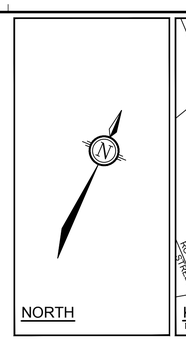


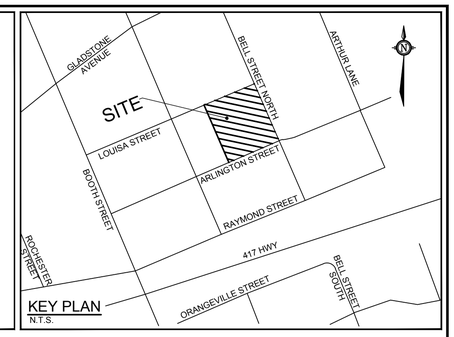

## INTERNAL SWM STORAGE SYSTEM

| DESIGN EVENT | STORAGE SYSTEM CONTROLLED FLOW | STORAGE VOLUMES | |
|---|---|---|---|
| | | REQUIRED | PROVIDED |
| 1:2 YR | 4.5 L/s | 18.9 m³ | > 69 m³ |
| 1:5 YR | | 28.9 m³ | |
| 1:100 YR | | 68.3 m³ | |

NOTES:

1. ALL DRAINAGE FROM AREA A-2 ( ALL ROOF + DECK DRAINS) TO BE DIRECTED TO THE INTERNAL STORMWATER STORAGE SYSTEM. REFER TO ARCHITECTURAL AND MECHANICAL PLANS FOR DETAILS.
2. REFER TO ARCHITECTURAL AND STRUCTURAL PLANS FOR EXACT SIZE AND DETAILS OF INTERNAL STORMWATER STORAGE SYSTEM.
3. REFER TO MECHANICAL PLANS FOR PUMP INFORMATION AND DETAILS OF THE INTERNAL STORMWATER STORAGE SYSTEM.




## LEGEND:

| | | | |
|---|---|---|---|
| | PROPERTY LINE | FFE | FINISHED FLOOR ELEVATION |
| RD | PROPOSED CONTROLLED FLOW ROOF DRAIN | T/FND | TOP OF FOUNDATION WALL ELEVATION |
| M IM | PROPOSED WATER METER AND REMOTE METER | USF | UNDERSIDE OF FOOTING ELEVATION |
| | PROPOSED BARRIER CURB | X | REMOVAL AND/OR ABANDONMENT |
| DC | PROPOSED DEPRESSED CURB | | WATERMAIN CAP |
| | PROPOSED BUILDING ENTRANCE | X | PROPOSED FENCE AND GATE |
| | PROPOSED WATER SERVICE | TP | PROPOSED TEST PORT |
| | PROPOSED STORM SERVICE | | PROPOSED SANITARY SERVICE |
| V&VB | PROPOSED VALVE AND VALVE BOX | | PROPOSED STORM SERVICE |
| | PROPOSED THERMAL INSULATION | G | CBMH LID FOR SWM TANK OVERFLOW |
| GPRS | PROPOSED GAS PRESSURE REGULATING STATION | | PROPOSED SIAMESE CONNECTION |

| | |
|---|---|
| OHW | EXISTING OVERHEAD WIRES |
| | EXISTING CONCRETE CURB |
| SAN/MH | EXISTING SANITARY MANHOLE & SEWER |
| CBMH | EXISTING CATCHBASIN MANHOLE |
| STM/MH | EXISTING STORM MANHOLE & SEWER |
| CB | EXISTING CATCHBASIN C/W CATCHBASIN LEAD |
| HYD | EXISTING HYDRANT & VALVE |
| V&VB | |
| | EXISTING TREES / VEGETATION |
| EX UP | EXISTING UTILITY POLE |
| X X X | EXISTING FENCE |
| 300mmØ WM | EXISTING WATERMAIN |
| HYD | EXISTING HYDRANT C/W VALVE & LEAD |
| | EXISTING HYDRO TRANSFORMER |

## GENERAL NOTES:

1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
3. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
4. BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR $5,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
5. COMPLETE ALL WORKS IN ACCORDANCE WITH THE MOST CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS USING THE CURRENT GUIDELINES, BYLAWS AND STANDARDS INCLUDING MATERIALS OF CONSTRUCTION, DISINFECTION AND ALL RELEVANT REFERENCES TO OPSS, OPSD & AWWA GUIDELINES - ALL CURRENT VERSIONS AND 'AS AMENDED'.
6. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF MUNICIPAL AUTHORITIES.
7. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
8. ALL ELEVATIONS ARE GEODETIC.
9. REFER TO GEOTECHNICAL INVESTIGATION REPORT (PATERSON REPORT NUMBER PG5405-1 REVISION 3), DATED JULY 24 2024, PREPARED BY PATERSON GROUP INC., FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
10. REFER TO MECHANICAL PLAN FOR UN-CONTROLLED ROOF DRAIN INFORMATION.
11. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARD SURFACED AREAS AND DIMENSIONS.
12. REFER TO THE 'DEVELOPMENT SERVICING STUDY AND STORMWATER MANAGEMENT REPORT' (R-2020-130) PREPARED BY NOVATECH.
13. SAW CUT AND KEYGRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE-IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).

## SEWER NOTES:

1. SUPPLY AND CONSTRUCT ALL SEWERS AND APPURTENANCES IN ACCORDANCE WITH THE MOST CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS - ALL CURRENT VERSIONS AND "AS AMENDED".
2. SPECIFICATIONS:

| ITEM | SPEC. No. | REFERENCE |
|---|---|---|
| CBMH FRAME AND COVER | 401.010 - TYPE "B" | OPSD |
| STORM SERVICE | PVC DR 35 | |
| SANITARY SERVICE | PVC DR 35 | |
| SEWER TRENCH - BEDDING (GRANULAR 'A') COVER (GRANULAR 'A' OR GRANULAR 'B' TYPE I WITH MAXIMUM PARTICLE SIZE=25mm) | | |

3. THE SANITARY SERVICE LATERAL SHALL BE EQUIPPED WITH A BACKFLOW PREVENTER WITHIN THE BUILDING FOOTPRINT AS PER CITY OF OTTAWA STANDARD DETAILS S14.1 OR S14.2. REFER TO MECHANICAL PLANS FOR DETAILS.
4. THE STORM SERVICE LATERAL SHALL BE EQUIPPED WITH A BACKFLOW PREVENTER WITHIN THE BUILDING FOOTPRINT AS PER CITY OF OTTAWA STANDARD DETAILS S14. REFER TO MECHANICAL PLANS FOR DETAILS.
5. PIPE BEDDING, COVER AND BACKFILL ARE TO BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY. THE USE OF CLEAR CRUSHED STONE AS A BEDDING LAYER SHALL NOT BE PERMITTED.
6. INSULATE ALL SEWER PIPES THAT HAVE LESS THAN 1.5m COVER WITH UP TO 125mm THICK HI-40 RIGID INSULATION.
7. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES INDICATING ALL APPLICABLE SERVICING AS-BUILT INFORMATION SHOWN ON THIS PLAN. AS-BUILT INFORMATION MUST INCLUDE: PIPE MATERIAL, SIZES, LENGTHS, SLOPES, INVERT AND T/G ELEVATIONS, STRUCTURE LOCATIONS AND ANY ALIGNMENT CHANGES, ETC.
8. THE OWNER SHALL REQUIRE THAT THE SITE SERVICING CONTRACTOR PERFORM FIELD TESTS FOR QUALITY CONTROL OF ALL SANITARY SEWERS. LEAKAGE TESTING SHALL BE COMPLETED IN ACCORDANCE WITH OPSS 410.07.16, 410.07.16.04 AND 407.07.24. DYE TESTING IS TO BE COMPLETED ON ALL SANITARY SERVICES TO CONFIRM PROPER CONNECTION TO THE SANITARY SEWER MAIN. THE FIELD TESTS SHALL BE PERFORMED IN THE PRESENCE OF A CERTIFIED PROFESSIONAL ENGINEER WHO SHALL SUBMIT A CERTIFIED COPY OF THE TEST RESULTS.

## WATERMAIN NOTES:

1. SUPPLY AND CONSTRUCT ALL WATERMAIN AND APPURTENANCES IN ACCORDANCE WITH THE MOST CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS - ALL CURRENT VERSIONS AND "AS AMENDED".
2. SPECIFICATIONS:

| ITEM | SPEC. No. | REFERENCE |
|---|---|---|
| WATERMAIN TRENCHING | W17 | CITY OF OTTAWA |
| THERMAL INSULATION IN SHALLOW TRENCHES | W22 | CITY OF OTTAWA |
| THERMAL INSULATION BY OPEN STRUCTURES | W23 | CITY OF OTTAWA |
| WATERMAIN CROSSING BELOW SEWERS | W25 | CITY OF OTTAWA |
| WATERMAIN MATERIAL | PVC DR 18 (100mm AND LARGER) | |

3. EXCAVATION, INSTALLATION, BACKFILL AND RESTORATION OF ALL WATERMAINS BY THE CONTRACTOR. CONNECTIONS AND SHUT-OFFS AT THE MAIN AND CHLORINATION OF THE WATER SYSTEM SHALL BE PERFORMED BY CITY OFFICIALS. EXCAVATION, INSTALLATION OF SERVICE, BACKFILL AND RESTORATION BY THE CONTRACTOR.
4. WATERMAIN SHALL BE MINIMUM 2.4m DEPTH BELOW GRADE UNLESS OTHERWISE INDICATED.
5. PROVIDE MINIMUM 0.5m CLEARANCE BETWEEN OUTSIDE OF PIPES AT ALL CROSSINGS, UNLESS OTHERWISE INDICATED.
6. WATER SERVICE IS TO BE CONSTRUCTED TO WITHIN 1.0m OF FOUNDATION WALL AND CAPPED, UNLESS OTHERWISE INDICATED.

### PROPOSED 150mmØ WATER SERVICE TABLE - LOUISA STREET

| STATION | SURFACE ELEVATION | T/WM ELEVATION | COMMENTS |
|---|---|---|---|
| 0+00 | 71.60± | 69.40± ✱✱ | 150mmØ WM CONNECTION TO EX. 150mmØ WM |
| 0+05.9 | 71.83 | 69.43 | 150mmØ V&VB |
| 0+06.4 | 71.84 | 69.45 | CAP 0.5m FROM PROPERTY LINE |

✱ CONNECTION TO EXISTING 150mmØ WATERMAIN. EXACT ELEVATIONS TO BE FIELD DETERMINED.
✱✱ PROVIDE THERMAL INSULATION AS PER CITY OF OTTAWA DETAIL W22 IN SHALLOW TRENCHES AND/OR CITY OF OTTAWA DETAIL W23 ADJACENT TO OPEN STRUCTURES.

### PROPOSED 150mmØ WATER SERVICE TABLE - BELL STREET

| STATION | SURFACE ELEVATION | T/WM ELEVATION | COMMENTS |
|---|---|---|---|
| 1+00 | 71.60± | 69.37± ✱✱ | 150mmØ WM CONNECTION TO EX. 200mmØ WM |
| 1+03.0 | 71.74 | 69.34 | 150mmØ V&VB |
| 1+04.5 | 71.74 | 69.34 | CROSS UNDER 150mm GAS (T/GAS=70.84±, CLEARANCE = 1.35m±) |
| 1+05.2 | 71.75 | 69.35 | CAP 0.5m FROM PROPERTY LINE |

✱ CONNECTION TO EXISTING 200mmØ WATERMAIN. EXACT ELEVATIONS TO BE FIELD DETERMINED.
✱✱ PROVIDE THERMAL INSULATION AS PER CITY OF OTTAWA DETAIL W22 IN SHALLOW TRENCHES AND/OR CITY OF OTTAWA DETAIL W23 ADJACENT TO OPEN STRUCTURES.

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

## BENCHMARK INFO:

TOP OF SPINDLE OF EXISTING ON-SITE FIRE HYDRANT LOCATED NEAR THE SOUTH-WEST CORNER OF THE INTERSECTION OF ARLINGTON AVENUE AND BELL STREET.

GEODETIC ELEVATION = 73.21m. ALL ELEVATIONS ARE REFERRED TO THE CGVD28 GEODETIC DATUM, DERIVED FROM VERTICAL CONTROL MONUMENT NO. 3603 HAVING AN ELEVATION OF 76.959 METRES.

THE EXISTING GRADES SHOWN ON THE PLANS ARE TAKEN DIRECTLY FROM TOPOGRAPHICAL SURVEY PLAN (Ref. # 21029-20 JRE L1 7 PL 49 T F), PREPARED BY ANNIS, O'SULLIVAN, VOLLEBEKK SIGNED AND DATED NOVEMBER 20, 2020.

SURROUNDING BACKGROUND TOPO INFORMATION BEYOND THE LIMITS OF THE SITE SURVEY ARE SHOWN FROM CITY OF OTTAWA 1:1000 MAPPING FOR CONTEXT ONLY.

OWNER INFORMATION
IRONWOOD FUND LIMITED PARTNERSHIP
18 LOUISA STREET, SUITE 370
OTTAWA, ONTARIO, K1R 6Y6
NAME: KEN JENNINGS
PHONE: (343) 961-8380
admin@jenningsdevelopments.com

| No. | REVISION | DATE | BY |
|---|---|---|---|
| 3 | ISSUED FOR SITE PLAN CONTROL APPROVAL | AUG 07/24 | FST |
| 2 | REVISED PER CITY COMMENTS | NOV 10/21 | FST |
| 1 | ISSUED FOR SITE PLAN APPROVAL | MAY 28/21 | FST |

SCALE
1:200
1:200
0 2 4 6 8

DESIGN DM / SM
CHECKED FST
DRAWN DM
CHECKED SM
APPROVED FST

**FOR REVIEW ONLY**

LICENSED PROFESSIONAL ENGINEER
F.S. THAUVETTE
100041399
August 7, 2024
PROVINCE OF ONTARIO

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
18 LOUISA STREET

DRAWING NAME
GENERAL PLAN OF SERVICES

PROJECT No. 120206
REV REV # 3
DRAWING No. 120206-GP

D07-12-21-0102

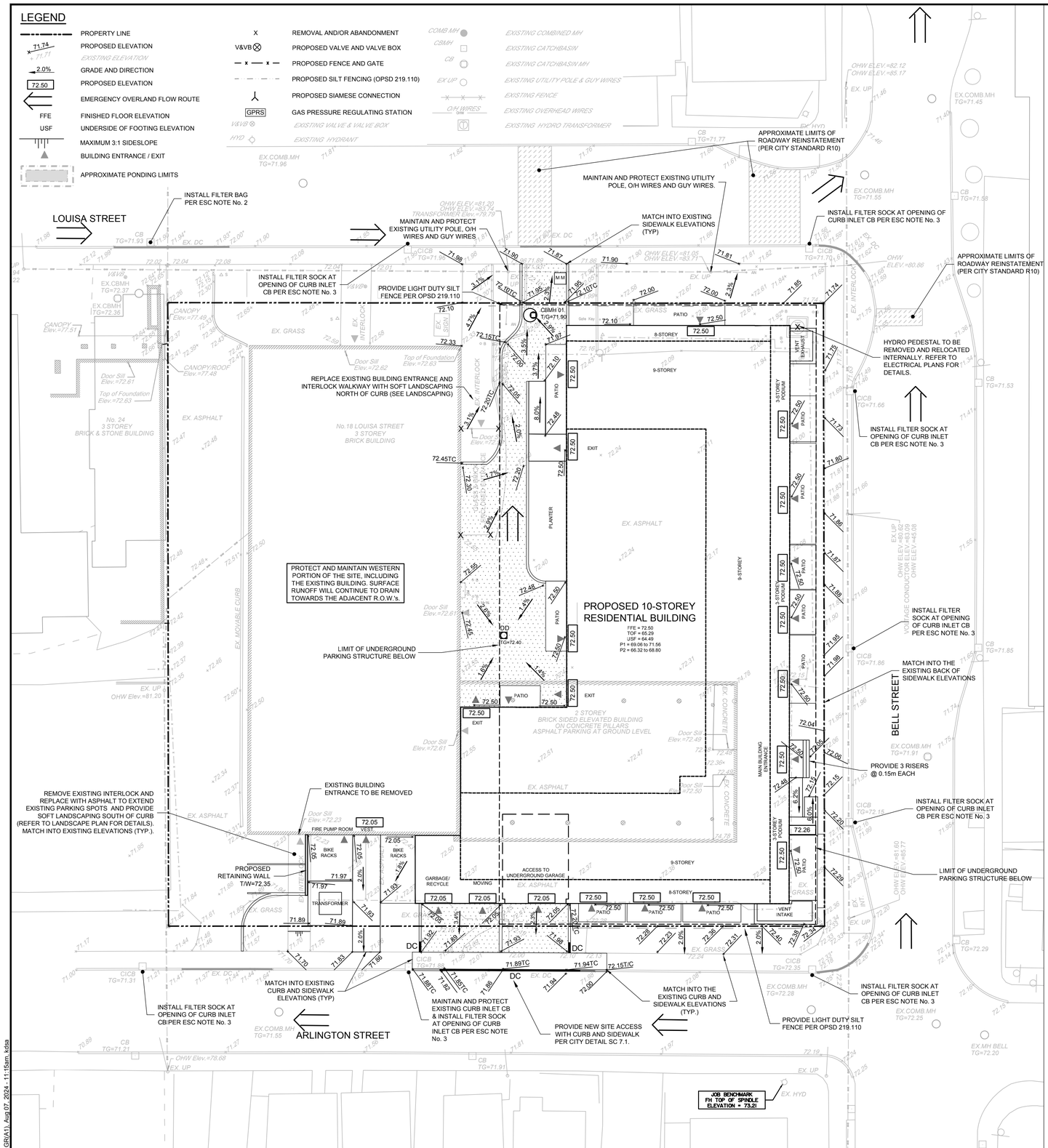
PLAN #18564

M:\2020\120206\CAD\Design\120206-GP.dwg, GPA1), Aug 07, 2024 - 1:02pm, kdsa

PLANA1.DWG - 841mmx594mm

## LEGEND

- PROPERTY LINE
- 71.74 / x 71.71 — PROPOSED ELEVATION / EXISTING ELEVATION
- 2.0% — GRADE AND DIRECTION
- 72.50 — PROPOSED ELEVATION
- EMERGENCY OVERLAND FLOW ROUTE
- FFE — FINISHED FLOOR ELEVATION
- USF — UNDERSIDE OF FOOTING ELEVATION
- MAXIMUM 3:1 SIDESLOPE
- BUILDING ENTRANCE / EXIT
- APPROXIMATE PONDING LIMITS
- X — REMOVAL AND/OR ABANDONMENT
- V&VB — PROPOSED VALVE AND VALVE BOX
- PROPOSED FENCE AND GATE
- PROPOSED SILT FENCING (OPSD 219.110)
- PROPOSED SIAMESE CONNECTION
- GPRS — GAS PRESSURE REGULATING STATION
- V&VB — EXISTING VALVE & VALVE BOX
- HYD — EXISTING HYDRANT
- COMB.MH — EXISTING COMBINED MH
- CBMH — EXISTING CATCHBASIN
- CB — EXISTING CATCHBASIN MH
- EX.UP — EXISTING UTILITY POLE & GUY WIRES
- EXISTING FENCE
- O/H WIRES — EXISTING OVERHEAD WIRES
- EXISTING HYDRO TRANSFORMER




## PAVEMENT STRUCTURE:

HEAVY DUTY PAVEMENT - ROADWAY RE-INSTATEMENT
MATCH EXISTING GRANULAR STRUCTURE OF ROADWAY
MATCH EXISTING ASPHALT THICKNESSES
NEW ASPHALT GRADE: PG 58-34

HEAVY DUTY PAVEMENT - ACCESS LANES AND LOADING AREA
40mm SUPERPAVE 12.5
50mm SUPERPAVE 19.0
150mm GRANULAR "A"
300mm GRANULAR "B" TYPE II
ASPHALT GRADE PG 58-34

## GENERAL NOTES:

1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
3. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
4. BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR $5,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
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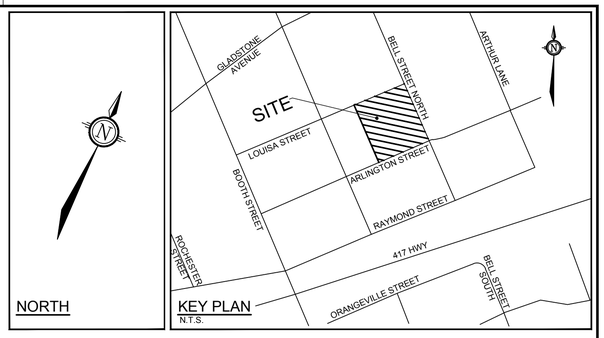
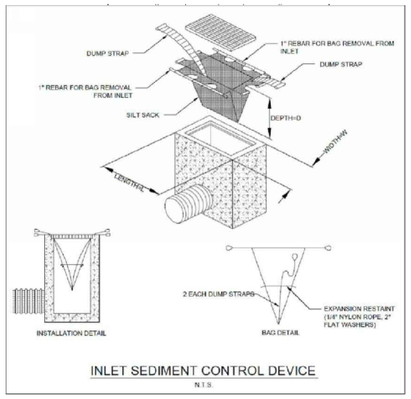
6. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY OF OTTAWA AND ENGINEER.
7. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
8. ALL ELEVATIONS ARE GEODETIC.
9. REFER TO GEOTECHNICAL INVESTIGATION REPORT (PATERSON REPORT NUMBER PG5405-1 REVISION 3), DATED JULY 24 2024, PREPARED BY PATERSON GROUP INC., FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
10. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARDSURFACE AREAS AND DIMENSIONS.
11. REFER TO DEVELOPMENT SERVICING STUDY & STORMWATER MANAGEMENT REPORT(R-2020-130) PREPARED BY NOVATECH.
12. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).




INLET SEDIMENT CONTROL DEVICE
N.T.S.

## GRADING NOTES:

1. ALL TOPSOIL, ORGANIC OR DELETERIOUS MATERIAL MUST BE ENTIRELY REMOVED FROM BENEATH THE PROPOSED PAVED AREAS AS DIRECTED BY THE SITE ENGINEER OR GEOTECHNICAL ENGINEER.
2. EXPOSED SUBGRADES IN PROPOSED PAVED AREAS SHOULD BE PROOF ROLLED WITH A LARGE STEEL DRUM ROLLER AND INSPECTED BY THE GEOTECHNICAL ENGINEER PRIOR TO THE PLACEMENT OF GRANULARS.
3. ANY SOFT AREAS EVIDENT FROM THE PROOF ROLLING SHOULD BE SUB-EXCAVATED AND REPLACED WITH SUITABLE MATERIAL THAT IS FROST COMPATIBLE WITH THE EXISTING SOILS AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER.
4. THE GRANULAR BASE SHOULD BE COMPACTED TO AT LEAST 100% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE. ANY ADDITIONAL GRANULAR FILL USED BELOW THE PROPOSED PAVEMENT SHOULD BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE.
5. MINIMUM OF 2% GRADE FOR ALL GRASS AREAS UNLESS OTHERWISE NOTED.
6. MAXIMUM TERRACING GRADE TO BE 3:1 UNLESS OTHERWISE NOTED.
7. ALL GRADES BY CURBS ARE EDGE OF PAVEMENT GRADES UNLESS OTHERWISE INDICATED.
8. ALL CURBS SHALL BE BARRIER CURB (150mm) UNLESS OTHERWISE NOTED AND CONSTRUCTED AS PER CITY OF OTTAWA STANDARDS (SC1.1).
9. REFER TO LANDSCAPE PLAN FOR PLANTING AND OTHER LANDSCAPE FEATURE DETAILS.
10. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GRADING PLAN INDICATING AS-BUILT ELEVATIONS OF ALL DESIGN GRADES SHOWN ON THIS PLAN.

## EROSION AND SEDIMENT CONTROL NOTES:

1. ALL EROSION AND SEDIMENT CONTROLS ARE TO BE INSTALLED TO THE SATISFACTION OF THE ENGINEER AND THE CITY OF OTTAWA. THEY ARE TO BE APPROPRIATE TO THE SITE CONDITIONS, PRIOR TO UNDERTAKING ANY SITE ALTERATIONS (FILLING, GRADING, REMOVAL OF VEGETATION, ETC.) AND DURING ALL PHASES OF SITE PREPARATION AND CONSTRUCTION. THESE PRACTICES ARE TO BE IMPLEMENTED IN ACCORDANCE WITH THE CURRENT BEST MANAGEMENT PRACTICES FOR EROSION AND SEDIMENT CONTROL AND SHOULD INCLUDE AS A MINIMUM THOSE MEASURES INDICATED ON THE PLAN.
2. A LIGHT DUTY SILT FENCE BARRIER WILL ALSO BE INSTALLED AROUND THE CONSTRUCTION AREA (WHERE APPLICABLE). THESE CONTROL MEASURES WILL REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETE.
3. TO PREVENT SURFACE EROSION FROM ENTERING ANY SEWER SYSTEM DURING CONSTRUCTION, FILTER BAGS WILL BE PLACED UNDER GRATES OF NEARBY CATCHBASINS AND STRUCTURES. TERRAFIX 8" ULTRA SILT SOCK (FILTER SOCK) IS TO BE USED AT THE OPENING OF ALL CURB INLET CATACHBASINS. A LIGHT DUTY SILT FENCE BARRIER WILL ALSO BE INSTALLED AROUND THE CONSTRUCTION AREA (WHERE APPLICABLE). IN AREAS WHERE SILT FENCING CANNOT BE INSTALLED PER OPSD 219.110 (i.e. HARD SURFACES), A FILTER SOCK SHALL BE SUBSTITUTED. THESE CONTROL MEASURES WILL REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETE.
4. THE SEDIMENT CONTROL MEASURES SHALL ONLY BE REMOVED WHEN, IN THE OPINION OF THE ENGINEER, THE MEASURES ARE NO LONGER REQUIRED. NO CONTROL MEASURES MAY BE PERMANENTLY REMOVED WITHOUT PRIOR AUTHORIZATION FROM THE ENGINEER.
5. THE CONTRACTOR SHALL IMMEDIATELY REPORT TO THE ENGINEER ANY ACCIDENTAL DISCHARGES OF SEDIMENT MATERIAL INTO ANY SEWER SYSTEM. APPROPRIATE RESPONSE MEASURES, INCLUDING ANY REPAIRS TO EXISTING CONTROL MEASURES OR THE IMPLEMENTATION OF ADDITIONAL CONTROL MEASURES, SHALL BE CARRIED OUT BY THE CONTRACTOR WITHOUT DELAY.
6. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
7. ROADWAYS ARE TO BE SWEPT AS REQUIRED OR AS DIRECTED BY THE ENGINEER AND/OR MUNICIPALITY.
8. THE CONTRACTOR SHALL ENSURE PROPER DUST CONTROL IS PROVIDED WITH THE APPLICATION OF WATER (AND IF REQUIRED, CALCIUM CHLORIDE) DURING DRY PERIODS.

### Erosion and Sediment Control Responsibilities:

| | | | | During Construction | | | After Construction Prior to Final Acceptance | | After Final Acceptance |
|---|---|---|---|---|---|---|---|---|---|
| | ESC Measure | Symbol | Specification | Installation Responsibility | Inspection/Maintenance Responsibility | Inspection Frequency | Approval to Remove | Removal Responsibility | Inspection/Maintenance Responsibility |
| Temporary Measures | Silt Fence | — · — · — | OPSD 219.110 | Developer's Contractor | Developer's Contractor | Weekly (as a minimum) | Consultant | Developer's Contractor | N/A |
| | Filter Fabric | Location as indicated in ESC Note #3 | Erosion and Sediment Control Notes | Developer's Contractor | Developer's Contractor | Weekly (as a minimum) | Consultant | Developer's Contractor | N/A |
| | Mud Mat | MM | Drawing Details | Developer's Contractor | Developer's Contractor | Weekly (as a minimum) | Developer's Contractor | Developer's Contractor | N/A |
| | Dust Control | Location as Required Around Site | Erosion and Sediment Control Notes | Developer's Contractor | Developer's Contractor | Weekly (as a minimum) | Consultant | Developer's Contractor | N/A |
| | Stabilized Material Stockpiling | Location as Required by Contractor | Erosion and Sediment Control Notes | Developer's Contractor | Developer's Contractor | Weekly (as a minimum) | Developer's Contractor | Developer's Contractor | N/A |
| | Sediment Basin (for flows being pumped out of excavations) | Location as Required by Contractor | - - - | Developer's Contractor | Developer's Contractor | After Every Rainstorm | Developer's Contractor | Developer's Contractor | N/A |

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

## BENCHMARK INFO:

TOP OF SPINDLE OF EXISTING ON-SITE FIRE HYDRANT LOCATED NEAR THE SOUTH-WEST CORNER OF THE INTERSECTION OF ARLINGTON AVENUE AND BELL STREET.

GEODETIC ELEVATION = 73.21m. ALL ELEVATIONS ARE REFERRED TO THE CGVD28 GEODETIC DATUM, DERIVED FROM VERTICAL CONTROL MONUMENT NO. 3603 HAVING AN ELEVATION OF 76.959 METRES.

THE EXISTING GRADES SHOWN ON THE PLANS ARE TAKEN DIRECTLY FROM TOPOGRAPHICAL SURVEY PLAN (Ref. # 21029-20 JRE L1 7 PL 49 T F), PREPARED BY ANNIS, O'SULLIVAN, VOLLEBEKK SIGNED AND DATED NOVEMBER 20, 2020.

SURROUNDING BACKGROUND TOPO INFORMATION BEYOND THE LIMITS OF THE SITE SURVEY ARE SHOWN FROM CITY OF OTTAWA 1:1000 MAPPING FOR CONTEXT ONLY.

OWNER INFORMATION
IRONWOOD FUND LIMITED PARTNERSHIP
18 LOUISA STREET, SUITE 370
OTTAWA, ONTARIO, K1R 6Y6
NAME: KEN JENNINGS
PHONE: (343) 961-8380
admin@jenningsdevelopments.com

| No. | REVISION | DATE | BY |
|---|---|---|---|
| 3 | ISSUED FOR SITE PLAN CONTROL APPROVAL | AUG 07/24 | FST |
| 2 | REVISED PER CITY COMMENTS | NOV 10/21 | FST |
| 1 | ISSUED FOR SITE PLAN APPROVAL | MAY 28/21 | FST |

SCALE: 1:200
1:200
0 2 4 6 8

DESIGN: DM / SM
CHECKED: FST
DRAWN: DM
CHECKED: SM
APPROVED: FST

**FOR REVIEW ONLY**

LICENSED PROFESSIONAL ENGINEER — F.S. THAUVETTE — 100041399 — August 7, 2024 — PROVINCE OF ONTARIO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LOCATION
CITY OF OTTAWA
18 LOUISA STREET

DRAWING NAME
GRADING AND EROSION & SEDIMENT CONTROL PLAN

PROJECT No. 120206-00
REV REV # 3
DRAWING No. 120206-GR

D07-12-21-0102

PLAN #18564

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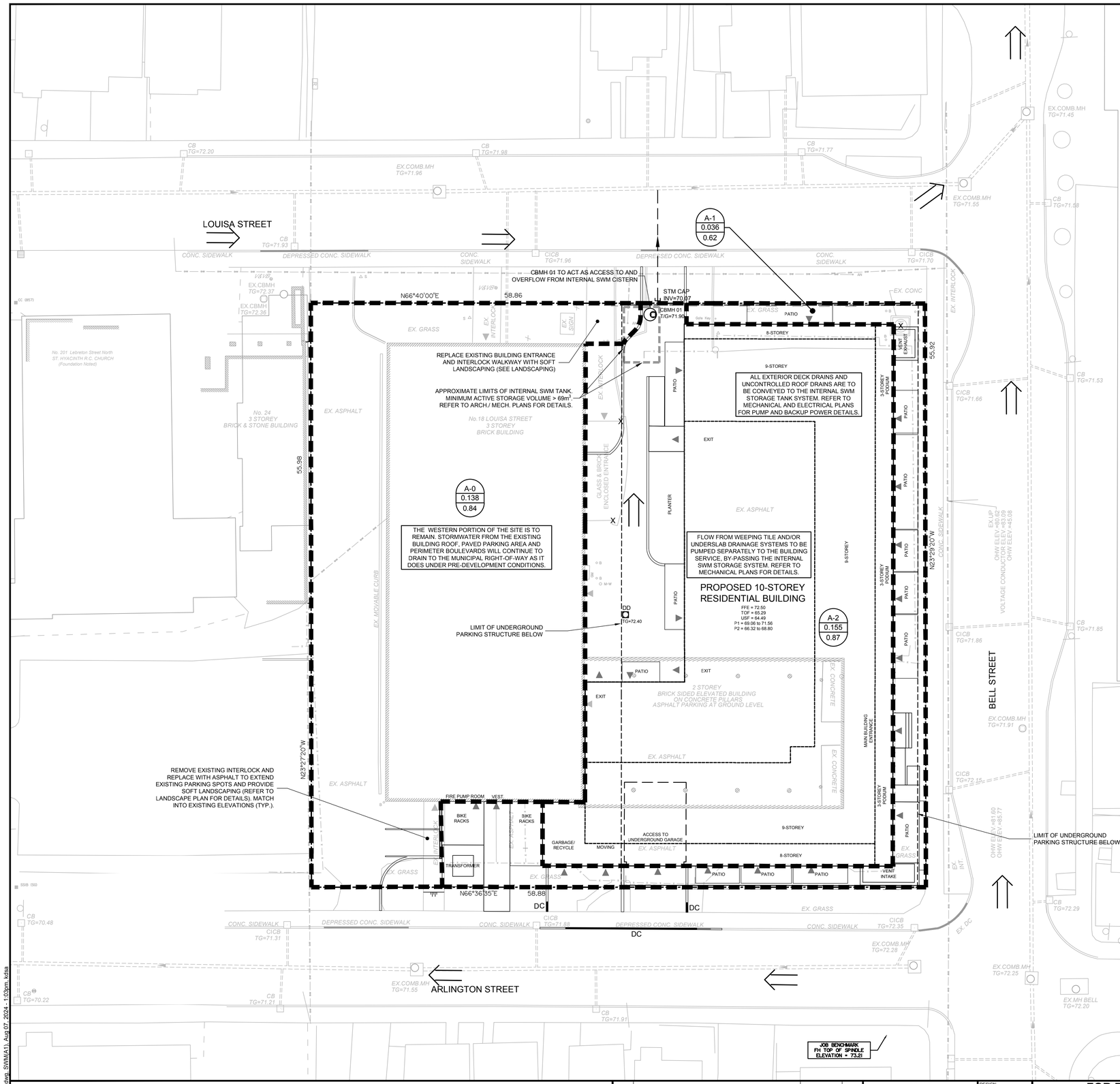


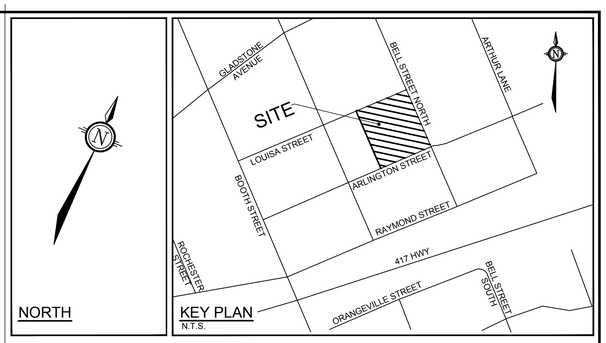


## LEGEND

- PROPOSED BARRIER CURB
- DC — PROPOSED DEPRESSED CURB
- DRAINAGE AREA LIMITS
- A-2 / 0.153 / 0.88 — POST-DEVELOPMENT AREA ID; POST-DEVELOPMENT DRAINAGE AREA (ha); 1:5 YEAR WEIGHTED RUNOFF COEFICIENT
- FFE — FINISHED FLOOR ELEVATION
- T/FND — TOP OF FOUNDATION WALL ELEVATION
- USF — UNDERSIDE OF FOOTING ELEVATION
- STM MH — EXISTING STORM MH & SEWER
- CB — EXISTING CATCHBASIN C/W CATCHBASIN LEAD
- PROPOSED STORM SEWER AND FLOW DIRECTION
- EMERGENCY OVERLAND FLOW ROUTE
- PROPOSED BUILDING ENTRANCE / EXIT

## GENERAL NOTES:

1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
3. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
4. BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR $5,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
5. COMPLETE ALL WORKS IN ACCORDANCE WITH THE MOST CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS USING THE CURRENT GUIDELINES, BYLAWS AND STANDARDS INCLUDING MATERIALS OF CONSTRUCTION, DISINFECTION AND ALL RELEVANT REFERENCES TO OPSS, OPSD & AWWA GUIDELINES - ALL CURRENT VERSIONS AND 'AS AMENDED'.
6. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY OF OTTAWA AND ENGINEER.
7. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
8. ALL ELEVATIONS ARE GEODETIC.
9. REFER TO GEOTECHNICAL INVESTIGATION REPORT (PATERSON REPORT NUMBER PG5405-1 REVISION 3), DATED JULY 24 2024, PREPARED BY PATERSON GROUP INC., FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
10. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARDSURFACE AREAS AND DIMENSIONS.
11. REFER TO DEVELOPMENT SERVICING STUDY AND STORMWATER MANAGEMENT REPORT (R-2020-130) PREPARED BY NOVATECH ENGINEERING CONSULTANTS LTD.
12. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
13. PROVIDE LINE/PARKING PAINTING.

### INTERNAL SWM STORAGE SYSTEM

| DESIGN EVENT | STORAGE SYSTEM CONTROLLED FLOW | STORAGE VOLUMES REQUIRED | STORAGE VOLUMES PROVIDED |
|---|---|---|---|
| 1:2 YR | 4.5 L/s | 18.9 m³ | > 69 m³ |
| 1:5 YR | | 28.9 m³ | |
| 1:100 YR | | 68.3 m³ | |

NOTES:

1. ALL DRAINAGE FROM AREA A-2 ( ALL ROOF + DECK DRAINS) TO BE DIRECTED TO THE INTERNAL STORMWATER STORAGE SYSTEM. REFER TO ARCHITECTURAL AND MECHANICAL PLANS FOR DETAILS.
2. REFER TO ARCHITECTURAL AND STRUCTURAL PLANS FOR EXACT SIZE AND DETAILS OF INTERNAL STORMWATER STORAGE SYSTEM.
3. REFER TO MECHANICAL PLANS FOR PUMP INFORMATION AND DETAILS OF THE INTERNAL STORMWATER STORAGE SYSTEM.

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

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DESIGN: DM / SM
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DRAWN: DM
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**FOR REVIEW ONLY**

LICENSED PROFESSIONAL ENGINEER
F.S. THAUVETTE
100041399
August 7, 2024
PROVINCE OF ONTARIO

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LOCATION
CITY OF OTTAWA
18 LOUISA STREET

DRAWING NAME
STORMWATER MANAGEMENT PLAN

PROJECT No. 120206
REV REV # 3
DRAWING No. 120206-SWM

D07-12-21-0102

PLAN #18564

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